

**A Delphi Study to Gain Consensus on the Definition, Domains and
Elements of Physical Literacy**

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My interest in undertaking a postgraduate research degree initiated in early 2015, from my role at Boing Kids, where I was Managing Coach. Boing is a child-led, constructivist, play-based approach to physical education, aimed to enhance physical literacy development in children. However, as a practitioner working within this sector, it became apparent that there was a disconnect between theory and practice, particularly regarding a pedagogic model of implementing physical literacy. In order to aid the physical literacy development of children, I asked myself, on a regular basis, what am I teaching and what is the best method of achieving this. This uncertainty sparked my research question.

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Abstract

Background: Physical literacy is broadly understood as an individual's capacity to engage in an active and healthy lifestyle (Francis *et al.*, 2016). The concept cognates physical activity and is beginning to gain prominence in Western discourses of health and education (Delaney *et al.*, 2008; Higgs *et al.*, 2008; Mandigo *et al.*, 2009; Keegan *et al.*, 2013; YST, 2014). Margaret Whitehead predominantly evolved and developed the concept (Whitehead 1999, 2001, 2007, 2009, 2010), which is beginning to embed as an outcome of physical education curricula around the world (YST, 2014; Keegan *et al.*, 2016; PHE Canada, 2016). However, despite the fact that conceptual clarity is slowly emerging (Edwards *et al.*, 2016), which is based upon one relatively clear philosophical approach (Whitehead 2007), competing definitions continue to exist (PISE, 2016; PHE Canada, 2016; SHAPE America, 2016). These definitions have eroded the epistemological nuances of Whitehead's (2010) concept as a number of interventions have reduced the essence of physical literacy to purely the mastery of fundamental movement skills (Edwards *et al.*, 2016). Francis *et al.* (2016) portray that this is due to a 'lack of consensus, regarding the constituent subdomains' (p. 214). This combined has resulted in blurred conceptualisations of physical literacy, of which, in the context of the United Kingdom has prevented the concept from moving into mainstream educational policy and practice. This is a concern given the associated social and health benefits of this 'healthy living construct' (Francis *et al.*, 2016: p. 214).

Objective: The aim of this thesis is to respond to Francis *et al.* (2016) and gain consensus on the definition, domains and elements of physical literacy. This was achieved by aligning the domains and elements with its definition. This alignment responds to the calls to make the concept practitioner-friendly (Keegan *et al.*, 2016), whilst reifying the original philosophical pillars espoused by Whitehead (Jurbala, 2015).

Method: This thesis conducted a Delphi study as it allowed for a convergence of opinion, permitting consensus to be reached (Helmer and Rescher, 1959). This study was conducted via three rounds of electronic surveys, using Qualtrics Software Solutions, and took place between March 2017 and June 2017. 20 leading experts in physical literacy and its associated fields were invited to participate; whilst three declined and one did not respond, 16 experts participated in the study. One expert declined at the start of round 2 whilst another did not respond to round 3; therefore, the results are obtained from 14 panellists. The following themes structured the main discussions in each round: Round 1 – What is the definition and what are the domains of physical literacy? Round 2 – Rank these domains and discuss the elements that underpin them. Round 3 – Rank these elements and discuss how these elements might be measured? Each round was active for a period of two weeks and consensus was reached following $\geq 75\%$ agreement among panellists.

Results: 87.5% of panellists completed all three rounds of the study. Consensus was reached on the definition, domains and elements. The study found that the philosophies of embodiment, existentialism and phenomenology overarch the concept and convergence was gained on the International Physical Literacy Association's (IPLA) definition. IPLA (2016) define physical literacy as 'the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life'. The results also indicated that four domains underpin the definition; furthermore, the elements that make up these domains were agreed upon.

Conclusion: The findings in this study respond to Francis *et al.* (2012), in that the elements and domains of physical literacy are realigned to its definition. This alignment maintains the original premise of Whitehead (2010) and Mandigo *et al.* (2012) respectively, but adds

academic rigour in that it connects elements to these conceptualisations. Therefore, this re-conceptualised framework adds value in that it allows practitioners to be better placed to apply the concept to their practice. Future research can use this re-conceptualised framework to design a protocol to chart physical literacy development in children and adults.

Keywords: physical literacy, domain-element, re-conceptualised framework, Delphi study.

1.0 Introduction

Margaret Whitehead's reasoning for the need to develop an additional concept in the field of health and physical activity was threefold. The first stemmed from her view that the importance of movement development in a child's education was being forgotten, especially in the early stages of development, as instead educational policy focused heavily on literacy and numeracy (Whitehead, 2010). The second reason corresponded to the growing rate of physical inactivity, whilst the third emulated concern of the direction that educational policy was taking in schools, which was being geared 'towards high level performance and elitism' (Whitehead, 2010: p. 4).

The term *physical literacy* was 'decided on, as being the most appropriate terminology' (Whitehead, 2010: p. 5) to overarch the essence of exercise and health, as first there is nothing exclusive pertaining to the term – every individual has, by nature, an embodied dimension. Second, the notion of literacy is accepted within the grasp of most people and, third, the term retains connection with our physicality but moves the focus away from a narrow performance base (Whitehead, 2010). From this, physical literacy is broadly understood as an individual's capacity to engage in an active and healthy lifestyle (Tremblay and Lloyd, 2010; Francis *et al.*, 2016). Taking this viewpoint forward physical literacy is conceptualised in figure 1 as a concept to overarch 'embodied health' (Whitehead, 2010: p. 12-14). Whilst the entities of exercise, sleep and nutrition conceptualise embodied health (Whitehead 2010), physical activity, sport, physical education and play are different modes of exercise.

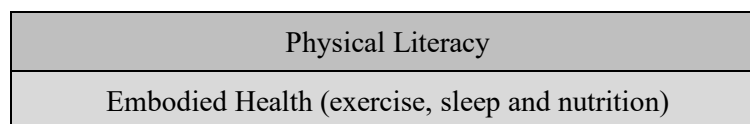


Figure 1: An overview of physical literacy (Whitehead, 2010)

Whitehead (2001, 2007, 2010) evolved the concept from existentialist and phenomenological schools of thought. The concept relates to bodily movement incorporated in

physical activity to improve health; however, this alone does not constitute a full definition (Hardman, 2011). This is because physical literacy ‘is not a purely bodily capacity, but rather it describes a holistic engagement that encompasses physical capacities embedded in perception, experience, memory, anticipation and decision making’ (Whitehead, 2001: p. 131). It applies to children and adults of all ages, throughout all stages of life (Whitehead, 2010; Taplin, 2012; Almond, 2013a, 2013c), which is why the concept is so critical. However, this instigates a problem as even though the concept is critical to healthy living (Taplin, 2012; Francis *et al.*, 2016) it is yet to move into mainstream health and educational policy (Edwards *et al.*, 2016) in the United Kingdom.

The reasons for this are threefold. First, physical literacy is only one of numerous competing concepts to have influenced physical activity, sport and physical education policy in recent years (Houlihan and Green, 2006). Second, there are contrasting notions on the purpose and nature of physical literacy in practice (Edwards *et al.*, 2016), due to the underpinning entities of physical education and sport (Lussier, 2010). Third, to align physical literacy to educational policy, the concept must be measurable (Tremblay and Lloyd, 2010; Longmuir, 2013). Nevertheless, leading academics (Hardman, 2011; Taplin, 2011; Whitehead, 2013) identify physical literacy as the key to unlocking the door to a healthy lifestyle, as Giblin *et al.* (2014) indicate that physical literacy is the focus of physical activity provision.

With physical literacy in the health spotlight, its associated landscape is a concern as physical inactivity is recognised as the fourth leading cause of global mortality (Kohl *et al.*, 2012) and there is international concern over the growing rate of childhood physical inactivity (Tremblay *et al.*, 2014; UK Active, 2014). For both children and adults, the health benefits of being physically active are well documented (WHO, 2010; Lee *et al.*, 2012 BHF, 2013), with Owen (2015) indicating that individuals who are physically inactive are 30% more likely to die prematurely. Therefore, the benefits of increasing one’s heart rate for 60 minutes of exercise

daily can reduce the risk of cardiovascular disease, diabetes and cancer (Warburton *et al.*, 2006; Owen, 2015). Yet in England, only one-in-five children meet the recommended daily level of moderate to vigorous physical activity (UK Active, 2014). Consequently, the National Health Service (NHS, 2012, 2017) continue to report that one-in-three children leave school at the end of Key Stage 2, aged 11, either overweight or obese; therefore, this decline in regular physical activity, along with sedentary lifestyle choices and poor diet, has resulted in an increase in obesity in adults (NHS, 2017).

Furthermore, Owen (2015) suggests that the British population is 24% less active compared to figures 50 years ago, which may be a direct result of a cultural shift towards computerised and mechanical labour; however, if this trajectory continues by 2030 the nation will be 35% less active (Designed to Move, 2013; Owen, 2015; NHS, 2017). Therefore, this suggests that there may be something fundamentally wrong with how individuals are introduced to physical activity, especially at a young age. This is a concern, as these figures suggest that the concept of physical literacy is not impacting society in the way that the rationale and understanding of the concept should. Furthermore, there is a fear that if children growing up are inactive, they as parents, in around 20 years' time, may not recognise the importance of physical literacy on their children's well-being (Higgs, 2010), therefore, potentially perpetuating the cycle.

Having said that, whilst there are a number of opportunities and interventions to increase and improve activity levels in both children and adults, Parker and Lepper (1992) imply that any such opportunities that promote fun and enjoyment are more likely to encourage future participation. However, these figures provide pertinent evidence that more needs to be done in these areas to overcome and prevent a further rise in physical inactivity.

The Department of Health (DoH, 2013) indicate that the direct cost on the National Health Service, as a result of inactivity and obesity is £5 billion per year, with an estimated

cost of £20 billion to the wider British economy. The link between physical inactivity and obesity can be seen in other locations around the world, with Giblin *et al.* (2014) indicating that the Australian Government invested \$AUS 200 million to develop and implement programmes that promoted physical activity. Future savings on healthcare as a result of improving the population's physical activity were estimated to equate to \$AUS 13.8 billion. Therefore, although there is no actual evidence of this at the moment, the considerable expense of promoting and implementing physical literacy provision seems legitimate when the potential return on investment is considered.

Despite this, Almond and Whitehead (2012) suggest that there is 'considerable confusion' (p. 1) about the focus and nature of the experiences involved in being physically literate. To expand, Roetert and Jeffries (2014) identify physical literacy as an international concept, by implying that in Africa physical literacy is linked with body culture and national identity, whilst in Australia the concept is aligned with health literacy and in New Zealand it is linked with spirituality; as a result, Corbin (2016) suggests that because societies have different cultures, the way in which physical literacy is defined varies. However, Edwards *et al.* (2016) attribute this confusion to the ontological and epistemological assumptions that arise from attempting to combine the philosophical underpinnings of monism, phenomenology and existentialism in order to comprehend the concept. This combination is challenging for practitioners and policy makers to access, operationalise and apply to practice. Jurbala (2015) summarises these assumption sets and implies that physical literacy is a complex concept. The reason for this confusion and complexity is that currently there are different ways of defining and operationalising the concept (Keegan *et al.*, 2009, 2016; Edwards *et al.*, 2016). This has resulted in a disconnect between theory and practice, and, as such, there is a misalignment between its overarching philosophy, its definition and its conceptual underpinnings. In this respect, Edwards *et al.* (2016) imply that physical literacy is 'in danger of becoming diluted,

redundant and meaningless' (p. 2), which is a concern given the overarching importance and its associated health benefits linked to the concept.

To overcome this, this study presents the research question: What is the overarching philosophy, the definition and underpinning elements of physical literacy? The consensus gained from this research question allows for a re-conceptualised framework to emerge. Primarily, this framework permits the concept to be accessible for practitioners to better align the concept to their practice and in doing so it presents the opportunity for physical literacy to be incorporated into educational policy in the United Kingdom.

In order to correspond to the research question, the thesis is split into five chapters: literature review, methodology, results and data analysis, discussion, and conclusion.

2.0 Literature Review

The physical literacy concept, developed by Whitehead (2001, 2007, 2009, 2010), emerged in the early 1990's from philosophical debates in existentialism and phenomenology (Whitehead, 1990). From a broad standpoint, these epistemological pillars personify interaction between individuals and their environment. As such physical literacy is a health capacity that is developed and maintained by all throughout the course of life (Whitehead, 2010; Roetert and Jefferies, 2014). Scientific papers on the concept increased from one in 1998 to 29 in 2014 (Keegan *et al.*, 2016) and, since, the concept has begun to move into Western discourses of health and education (Capel and Whitehead, 2012; Kirk, 2013; Castelli *et al.*, 2014). From a global perspective, Spengler (2014) highlights 10 countries that recognise physical literacy within their government policy. Furthermore, Roetert and MacDonald (2015) indicate that seven of these countries are ranked within the top 25 countries for obesity prevalence. This correlation depicts the thought that affluent governments are beginning to recognise the importance of physical literacy intervention, as a means to reduce obesity.

This view is exemplified by the Canadian government, who have begun to incorporate physical literacy into schools and national sporting federations (Roetert and MacDonald, 2015; participACTION, 2015), as the Ontario Ministry of Education launched its Health and Physical Education Curriculum to generate a population of physically literate students (Mandigo *et al.*, 2009). To date, the consensus is that individuals who demonstrate good physical literacy are more likely to be active for life (Keegan *et al.*, 2016). However, this statement is a concern, as it fails to recognise what good physical literacy is and how this is measured. Moreover, it suggests that being physically literate equates to being active for life, however, to be critical, this cannot be the case, as for example it fails to incorporate the implications of injury. As such, the sentiment of what physical literacy is and how it is applied to practice forms the crux of this investigation.

In order to correspond to the crux of this investigation, the literature review is split into two parts. The first part comprises the discussion on philosophy, ontology and the definition of physical literacy, whilst the second comprises the discussion concerning physical literacy in practice.

Part 1: Discussion on Philosophy, Ontology and Definition of Physical Literacy

Physical literacy is a developmental understanding of one's self as an embodied, relational and ecological being (Whitehead, 2001, 2007, 2009, 2010). This outlook establishes exercise, alongside sleep and nutrition, as an integral part of our daily living (Whitehead, 2010; Taplin, 2013; Castelli *et al.*, 2014). Over time, the definition of physical literacy has evolved to emphasise embodiment, encompassing motivation, confidence and perceptions of competence connected to participating in physical activity (Edwards *et al.*, 2016). Embodiment is the ontological framework which supports the epistemological pillars of existentialism and phenomenology, and will be explained further.

2.1.1 Overarching Philosophy

At the heart of existentialist theory is the understanding that an individual's unique perspective of the world arises due to the experiences of interacting with the world around them (Sartre, 1963, 1976, 1981). In contrast, the case of phenomenology originates from the way in which an individual perceives the world from their unique point of view (Merleau-Ponty, 1964). Merleau-Ponty (1964) asserts that the study of human existence ought to be in the context within which it takes place. Therefore, to take a phenomenological approach is to understand that individual's construct themselves out of their constant interaction with the world; thus, the

nature of human existence is indeed existential but, by default, is one of being in the world (Whitehead, 2001).

For this reason, phenomenological philosophy proposes that the world can only be experienced from the standpoint of the individual, as no other channel of experience (essentialist or otherwise) exists. From such epistemological pillars, Merleau-Ponty (1964) established a monistic perspective of the individual, where body and mind cannot be considered in isolation. Instead, body and mind are ‘irreconcilably interwoven in existence’ (Whitehead, 2001: p. 128). From this prospective it is understood that one does not have a body, but rather one *is* their body, thus body and mind are one (Whitehead, 2007). The inextricable and unrelenting interplay with the environment around us, which we are constituted by and are a constant part of, means that ‘our body is the entry point into the world, the medium through which and in which our reality is constituted’ (Whitehead, 2001: p. 129). This standpoint firmly identifies that our most fundamental state is an embodied one; we only exist because we are corporeally located in particular moments in time and space, therefore, without a body – to see, hear, touch, smell and taste the world around us – we could not exist as our mind alone (O’Brian, 2009). This embodied interaction of human existence, and the central premise that all humans are in constant interaction with the world, initially sparked the concept and has remained at the theoretical core of physical literacy.

2.1.2 Whitehead’s (2010) Conceptualisation of Physical Literacy

Founded from these philosophical roots, Whitehead (2010) established a conceptual model of physical literacy. Whitehead based this model on her own significant works (Whitehead, 1990, 2001, 2005, 2007, 2009), and on that of other key authors (Haydn-Davis, 2005; Mandigo *et al.*, 2009; Higgs, 2010). The model focuses on mutual interplay between motivation, confidence, competence and the environment, and is constituted by six crucial components:

1. *Physical literacy can be described as a disposition, characterised by the motivation to capitalise on innate movement potential, to make a significant contribution to the quality of lifestyle.*
2. *Individuals who are physically literate will move with poise, economy and confidence in a wide variety of physically challenging situations.*
3. *Physically literate individuals will be receptive to reading all aspects of the physical environment, anticipating movement needs or possibilities and responding appropriately to these with intelligence and imagination.*
4. *These individuals will have a well-established sense of self, as embodied in the world. This together with an articulate interaction with the environment will engender positive self-esteem and self-confidence.*
5. *Sensitivity to and awareness of embodied capability will lead to self-expression through non-verbal communication and to perceptive and empathetic interaction with others.*
6. *Physically literate individuals will have the ability to identify and articulate the essential qualities that influence the effectiveness of their own movement performance, and will have an understanding of the principles of embodied health with respect to basic aspects such as exercise, sleep and nutrition.*

(Whitehead, 2010: pp. 12-14)

Whitehead (2010), who draws her definition of the concept from this six-point model, defines physical literacy as ‘appropriate to each individual’s endowment, physical literacy can be described as the motivation, confidence, physical competence, understanding and knowledge to maintain physical activity throughout the life course’ (pp. 11-12).

In order to understand the conceptual complexities of Whitehead's work, the parameters within which the definition and its overarching six-point model sit are worthy of note. Firstly, movement is at the core of physical literacy (Hardman, 2011), but this component alone does not and cannot constitute a full definition (Whitehead, 2001). This is because physical literacy 'is not a purely bodily capacity, but rather it describes a holistic engagement that encompasses physical capacities embedded in perception, experience, memory, anticipation and decision making' (Whitehead, 2001: p. 131). Secondly, physical literacy is not an elitist or dualist concept; instead it is about the progression of one's self in a health context, rather than the mastery of skill acquisition and movement competency (Whitehead, 2010; Taplin, 2012; Jurbala, 2015). With this in mind, the concepts of physical literacy and physical activity differ. As such, leading academics (Hardman, 2011; Taplin, 2011; Whitehead, 2007, 2010, 2013a; Giblin *et al.*, 2014) identify physical literacy as the key to unlocking the door to physical activity provisions.

Couched in these philosophical foundations, physical literacy is positioned as a lifelong process (Whitehead, 2001, 2010), 'in which the mind and body continuously adapt to the changes that come as a result of the human development and aging cycle' (Higgs, 2010: p. 6). As such, the understanding to be physically literate is not a personal skill, but rather a disposition to use the entities of embodied health to interact effectively (Whitehead, 2010). Therefore, the journey of developing one's physical literacy is individual and different (Taplin, 2012; Roetert and Jeffries, 2014). Furthermore, whilst Whitehead's (2010) definitional model personifies a crucial component of human existence (Giblin *et al.*, 2014), physical literacy should not be viewed simply as a state of being (Whitehead, 2010). Instead, it is as a capability that has to be developed and maintained throughout the course of life.

To articulate this, Whitehead's definition can be described in two stages. This not only highlights the inter-relationship between the key attributes of the concept, but provides the opportunity for motivation, confidence and physical competence, and effective interaction with the environment to form the basis of the health concept. These attributes are mutually reinforcing, as indicated in Figure 2.

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Figure 2: The inter-relationship between the key attributes of physical literacy (Whitehead, 2010: p.15)

To analyse this reciprocal relationship, Whitehead (2010, 2013b) signifies that motivation encourages participation, as this involvement can enhance confidence and physical competence, whilst the development of this confidence and competence can in turn maintain or increase motivation. Alongside this, the development of confidence and physical competence can facilitate fluent interaction with a wide range of environments. This effective relationship with the environment, with the new challenges this presents, can in turn enhance confidence and physical competence. The success of developing effective relationships with a range of environments can add to an increase in motivation, and this enhanced motivation can in turn encourage exploration and promote effective interaction with the environment.

Figure 3 portrays the relationships between all the attributes associated with the health concept. According to Whitehead (2010, 2013b) the sense of self and self-confidence, self-expression and communication with others, and knowledge and understanding characteristically develop as motivation, confidence and physical competence, and fluent interaction grows. For example, as individuals have successful and rewarding experiences in physical activity they can experience a positive sense of self and enhance their self-confidence. In addition, this model presents an awareness of the embodied dimension alongside a sense of

self-esteem, which in turn could promote fluent self-expression along with perceptive and empathetic interaction with others. Furthermore, knowledge and understanding will be enriched by all aspects of participation.

Figure 3 also indicates how these three attributes (D, E and F) can help to further the core attributes of motivation, confidence and physical competence, and fluent interaction with the environment. For example, an assured sense of self will feed into motivation and the willingness to accept challenges, while fluent interaction with others will add to the confidence and the ability to work alongside others in physical activity settings (Whitehead, 2010, 2013b).

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Figure 3: The relationship between all the attributes of physical literacy (Whitehead, 2010: p.16)

To be critical, figure 3 is abstract and falls short to suggest how this process of development is best achieved (Keegan *et al.*, 2016). Sport Wales (2015) interpret figure 3 as physical skills + confidence + motivation + lots of opportunities. However, if practitioners are unfamiliar with the overarching philosophy, which is evident as 33% of papers systematically reviewed by Edwards *et al.* (2016) did not declare or discuss any philosophical considerations, then the term *physical* maybe misconstrued. As a result, there is scope that practitioners may define the concept using a dualistic ontology (Jurbala, 2015). With this in mind the ontological landscape, in which the concept has had to develop, will be looked into.

2.1.3 Ontological Landscape

Edwards *et al.* (2016) declare that physical education is the most popular contextual core-category to associate physical literacy. However, the centrality of embodiment within which Whitehead's (2010) conceptualisation of physical literacy sits questions the paradigm that has, in recent years, predominantly defined Western discourse of physical education provision (Capel and Whitehead, 2012).

Understanding movement and one's physical being cannot be abstracted from the context within which it happens, however, despite this, the dominant ontology of the body as an object remains (Whitehead, 2010; Liedl, 2013; Tompsett *et al.*, 2014), particularly in physical education where the focus has been on developing competency via fundamental movement skills (DfE, 2013). According to Lloyd (2011) and, later, Almond (2013a, 2013b), physical literacy has been abstracted from any connection to the individual and de-contextualised from the settings within which it happens.

This is the landscape within which over the last two decades, physical literacy has had to evolve and mould its theoretical ideals into an applicable model. As a result, Whitehead's (2010) conceptual model has been compromised by a world defined by dualistic parameters, where the mind and body are viewed separate (Descartes, 1984). Consequently, physical literacy has lost touch with its central pillar of embodiment, upon which it was built (Jurbala, 2015). Furthermore, as a result of the conjunctural landscape and the need to respond to its relentless quest of modernist and reductionist clarity, the complex epistemological pillars upon which physical literacy was conceived have become muddled (Jurbala, 2015). At best, they have been made second rate to the lowest common denominator – fundamental movement skills (DfE, 2013; PISE, 2016) – and at worst they have been discarded by many practitioners as unnecessary and overly-academic (Jurbala, 2015).

The attempt of aligning this monistic concept to a dualistic landscape has caused educational organisations, research groups and governments around the world to promote conceptual intervention (Edwards *et al.*, 2016). However, according to Keegan *et al.* (2016), these groups define and apply the construct differently. This has resulted in a theory-to-practice misalignment.

To be critical, Whitehead (2010) suggests herself that it may be practical to move away from the rigid explanation of the characteristics of a physically literate individual, as set out in figure 3. This is because individuals will need to present themselves with different attributes that are seldom mentioned in the definition above in order to overcome the questions presented in different everyday situations. As such, the concept may require a realignment and/or a rethinking of attitudes towards our embodied health dimension. Thus, in some instances, the development of a new perspective of our human nature will mean the creation of new terminology and possibly the introduction of new discourse (Whitehead, 2010). Therefore, it is this notion of rethinking that has given educational organisations and research groups the flexibility to define and implement the construct differently.

2.1.4 An Analysis of Current Definitions

Taking the term *physical literacy* forward, it is evident that a majority of educational groups simplify physical literacy and define the concept as movement and skill development (Sport Wales, 2015; PISE, 2016; PHE Canada, 2016; SHAPE America, 2016). It is pertinent to suggest that this may be a result of the ontological landscape; however, it is a concern as this fails to recognise the underpinning importance of health. Jurbala (2015) implies that this oversimplification of skill development is a direct consequence of the ontological and epistemological pillars of the concept being inaccessible to practitioners working within the educational and health sector. For this reason, physical literacy is in danger of becoming diluted,

or worse still – meaningless (Edwards *et al.*, 2016). Therefore, given the importance of this construct on the health of our society (Francis *et al.*, 2016), it is the job of academics and practitioners to reinstate the theoretical imperative of embodiment to the forefront of any practical application of physical literacy. What is needed then is to reverse this trend of reductionism, whilst attending to the demand to make the concept practitioner-friendly. The difficulty is to reach this without shying away from the ontological imperative of embodiment. To provide insight, an analysis of competing definitions is needed. Appendix 1 provides a summary of this analysis.

It is a concern that no definition presented in Appendix 1 is totally accepted within the educational and health fields. However, having said that, the International Physical Literacy Association (IPLA) – of which Margaret Whitehead is the President – is arguably the main source of the development of the concept. Based in the United Kingdom, the IPLA aims to promote the value of physical literacy worldwide by continuing to develop the concept through scholarly activity, whilst preserving its integrity. From this, it is understood that the IPLA is the main source of the four key definitional attributes (motivation, confidence, competence, and knowledge/understanding); however, its definition appears to describe a desirable state rather than a developmental process.

On the premise of this, Mandigo *et al.* (2012) ascribe physical literacy to the capacities that are linked to the development of the whole person. Taking these capacities forward, the Australian Sports Commission (ASC) aimed to make the concept practitioner-friendly. The ASC (2016) defines physical literacy as:

‘lifelong holistic learning acquired in movement contexts. It reflects on-going changes integrating physical, affective, cognitive and social capabilities. It is vital in helping us lead healthy and fulfilling lives through movement and physical activity. A physically literate person is able to draw on their integrated

physical, affective, cognitive and social capabilities to support health, promoting and fulfilling movement and physical activity – relative to their situation and context – throughout the lifespan.’

This definition is the resultant of the work of Keegan *et al.* (2016), whose collaborative research set out to provide a working definition in order to underpin educational and health policy in Australia. It is pertinent to note that both Mandigo *et al.* and Keegan *et al.* decipher the four attributes of physical literacy (motivation, confidence, physical competency and understanding) as defined by the IPLA into domains to underpin their definitions of physical literacy. As a result of this development, these domains have since been justified via a blog post on the IPLA website. This clarification reads as follows:

‘to be physically active, individuals call on their affective, cognitive and physical domains. They need to be motivated, confident and competent. These elements are entwined and are co-dependant – physical literacy is the blend of these elements. If one or more of the elements is lacking, or lagging behind the other elements (or if we focus solely on one aspect) the capacity to be physically literate is affected.’

(IPLA, 2014)

This clarification post not only combines the domains attributed by Mandigo *et al.* and later Keegan *et al.*, but reemphasises the integrated, holistic nature of the concept, which was key to the conceptualisation originally put forward by Whitehead. Furthermore, this clarification indicates that the rethinking and realignment process that Whitehead (2010) declared, has taken place. Therefore the realigned framework – which includes the domains – announces that the definition informs the domains of physical literacy. In regard to a practical understanding, these domains are underpinned by a number of elements (Keegan *et al.*, 2016); however, taking this framework forward, it is unclear of what the domains or elements are, or indeed how many of each there are.

Figure 4 outlines the original development taken by Mandigo *et al.* (2012) to align the definition of physical literacy to a practical conceptualisation.

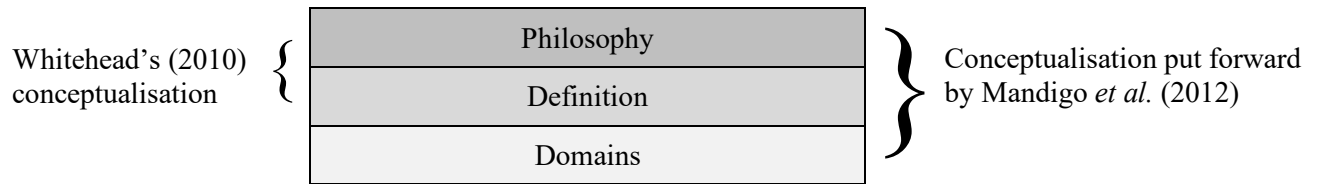


Figure 4: Outline of the conceptual development of physical literacy (prior to this study)

2.1.4.1 Lack of Consensus

With the current definitions of physical literacy analysed in Appendix 1, the lack of consensus is a concern (Tremblay and Lloyd, 2010) given that the majority of definitions synonymously link physical literacy with fundamental movement and motor skill development. Jurbala (2015) insinuates that interventions implementing physical literacy via fundamental movement skills reduce the holism of Whitehead's (2010) definition. Reducing the concept to physical competence only, in order to comprehend a practitioner-friendly approach threatens the rigour associated with Whitehead's (2010) entwined and embodied health vision and instead aligns to a dualistic ontology.

Whitehead's (2013a, 2013b) efforts to maintain correspondence with the embodied being in a working model of physical literacy then have fallen short. In fact, definitions presented by SHAPE America (2016) and PISE (2016) are almost unrecognisable from the vitality that its complex epistemological origins afforded it. Due to the need to respond to calls to make physical literacy applicable, it has been distilled to its most simple form. PISE's (2016) definition exemplify this, in that fundamental movement skills are all important in one's quest to becoming physically literate, as they suggest that the development of fundamental movement skills are the basic building blocks for the overall development of physical literacy, much like

learning the alphabet and phonics (Mandigo *et al.*, 2007). Within physical education, the concept now is considered little more than one's competence in skill development, as it is perceived by most that the ability to run, jump, throw and catch, or to develop attributes such as balance, agility and coordination largely constitutes a child being physical literate. This standpoint is a concern, as it fails to recognise the important position of the wider entities that encompass health.

With the proposition of fundamental movement skills deterring the underpinnings of the concept, Edwards *et al.* (2016) conducted a systematic review on the core attributes of the physical literacy construct. Their aim was to collate, analyse and evaluate these, as reflected in contemporary literature. By analysing their results, this allows for the attributes and elements of the concept to be looked into in further detail.

2.1.4.2 Edwards et al. (2016): A Systematic Review

In order to complete their literature search, five databases were examined using PRISMA guidelines. The inclusion criteria were English language, peer reviewed, published by March 2016 and seeking to conceptualise physical literacy (Edwards *et al.*, 2016). Articles that met these criteria were analysed in relation to three core areas: a) properties/attributes; b) philosophical foundations; and c) theoretical associations with other constructs. A total of 50 published articles met the inclusion criteria and were analysed using a qualitative inductive thematic analysis (Edwards *et al.*, 2016). Although, 36 out of 50 articles were from different first authors, 'one relatively clear philosophical approach was prominent in approximately half of the articles, based on a monist ontology and a phenomenological epistemology' (Edwards *et al.*, 2016: p. 1). As such, 35 articles (70%) adopted the conceptualisation (figure 3) put forward by Whitehead (Edwards *et al.*, 2016). It is to note, however, that out of these 35 articles, eight

had been written by Whitehead herself; nevertheless, Edwards *et al.* emphasise that a *Whiteheadian* approach to conceptualise physical literacy is widely accepted.

Having said that, 10% of the articles in their review referred to a different approach, namely the Long-Term Athlete Development (LTAD) approach. This indicates that there is an alternative approach to conceptualise physical literacy, and one that must therefore be addressed when discussing how physical literacy is expressed and defined. It is to note that Edwards *et al.* (2016) explicitly declare that their systematic review does not answer the question of which philosophy or definition is correct; therefore, in order to establish which is correct the key differences between the 50 articles must be looked into in further detail.

2.1.5 One Concept: Two Approaches?

Although Edwards *et al.* highlight two approaches to physical literacy, it was Higgs (2010) that originally proposed the notion of there being two approaches: an academic approach – this being the conceptualisation put forward by Whitehead (2010), and a practical approach – this being the LTAD model. This disconnect between the two approaches hints that the theory to practice gap, which is at the root of investigation has been found. Therefore, in order to be transparent and clear of which approach is to be taken forward, it is first important to clarify which is being referred to. Consequently, it is necessary to expand on these differences so that meaningful research findings can occur (Keegan *et al.*, 2013). As, for example, when a study claims to have promoted physical literacy or supported/refuted the associated underpinnings, without knowledge of what exactly was tested, researchers are unable to attribute such research findings to that approach (Edwards *et al.*, 2016). As such, this disconnect presents the possibility that no scientific theory is being tested as it is unclear which approach is being referred to. For that reason only relative arbitrary and unscientific predictions can occur; hence

in the United Kingdom, the concept is yet to be infiltrated into mainstream educational and health policy.

As new programmes and interventions are released to promote physical literacy (as evidenced in Appendix 1), Edwards *et al.* (2016) suggest that it is a requirement for academics and practitioners to either resolve these differences or to embrace the diverse approaches in promoting the concept. It is to note that Edwards *et al.* initially recommend tolerating these approaches until further research in the field has been completed.

In order to develop coherent research and progress mainstream policy and practice, and as no other named approach gained more than a 10% share in the articles systematically reviewed (Edwards *et al.*, 2016) the remainder of this part of the literature review will analyse the two approaches named. The aim is to either resolve or embrace the differences between these two approaches so that the debate of defining the concept is overcome.

2.1.5.1 A Whiteheadian Approach

The conceptualisation of a Whiteheadian approach has been outlined via the six-point model and analysed in Chapter 2.1.2 above, which, to reiterate, is overarched by a monist ontology (embodiment), and existentialist and phenomenological epistemologies (Whitehead, 2001, 2007). Due to this overarching philosophy, physical literacy is a lifelong process. Given this, it is expected to encounter success and set-backs along the way (Liedl, 2013; Whitehead, 2013a). As such, every individual has the capacity to develop along their own physical literacy journey (Edwards *et al.*, 2016), as appropriate to their own capabilities, social and geographical contexts, and life experiences (Whitehead, 2007, 2013b, 2013c; Taplin, 2011; Edwards *et al.*, 2016).

In relation to developing physical literacy, Whitehead (2013c) indicates that individual's pass through six stages. These stages are: 1) preschool; 2) foundation/early years

and primary school; 3) secondary school years; 4) early adulthood years; 5) adult years; and 6) older adulthood years. A weakness of Whitehead's stages of development model, is that the deliverable content – in order to enhance development during these stages – for practitioners is missing. Therefore, a detailed analysis of the LTAD approach is needed so that the two approaches can be analysed.

2.1.5.2 The Long-Term Athlete Development Approach

Canadian Sport for Life (2015) established the LTAD model on the grounds to expose Canadians to develop appropriate physical activity throughout their life. The generic model divides the human lifespan into seven stages. These stages are designed to provide everyone with the skills, attitudes, and knowledge required to engage in life-long physical activity (Higgs, 2010). Higgs (2010) states that where 'individuals have the necessary talent, drive and commitment, the stages provide people with the opportunity to achieve sporting excellence' (p. 7). Canadian Sport for Life uses the term physical literacy to describe the combination of the first three stages of the LTAD model.

2.1.5.2.1 LTAD Stages of Development (Higgs, 2010)

1) Active Start (0-6 years of age): During this stage, children need to develop basic human movement skills, a positive attitude towards being active and habits of engaging in frequent physical activity throughout the day. It is recommended that children are vigorously active for at least 60 minutes every day (Higgs, 2010).

2) FUNDamentals (boys aged 6-9; girls aged 6-8): Due to the faster maturation rates of girls (Rogol *et al.*, 2000), this stage (and those that follow) occur at an earlier age compared to that of boys. This stage of development requires children to master fundamental movement skills. This is also the time in which children need to develop skills in different environments.

This model implies that to develop full physical literacy ‘children need to learn fundamental movement skills on land, in water, in the air and on ice’ (Higgs, 2010: p. 7).

3) Learn to Train (boys aged 9-12; girls aged 8-11): This stage ends at the start of a child’s adolescence growth spurt. Although this growth spurt is individually dependent, this stage is the time for children to learn fundamental sport skills. Higgs (2010) indicates that children should not specialise too early, except in those few known early development sports such as gymnastics, diving and figure skating, as it is ‘during this stage of development in which the brain reaches close to adult volume and when the child’s body is suited to the learning and refinement of skills’ (Higgs, 2010: p. 7). In terms of late maturation rates, this provides these individual’s longer to refine their skills, which may pay dividends once that child has matured.

In Canada, engagement in physical activity for life is predicated on the grounding that every child needs to be exposed to quality activity programmes, which occur throughout the first three stages of development. These stages are also vital if individuals want to pursue excellence in sport, as these provide the pathway to the (4) ‘Train to Train’, (5) ‘Train to Compete’ and (6) ‘Train to Win’ stages of development (Higgs, 2010).

To compare the two approaches, first it is evident that a Whiteheadian approach identifies stages of development, whereas the first three stages of the LTAD model (of which Canadian Sport for Life use to define physical literacy) are age specific. This difference is significant as individuals develop at different stages based upon their age (Rogol *et al.*, 2000) and their life experience (Jurbala, 2015). Second, the content to enhance development during these stages of the LTAD model is made explicit. Third, the LTAD model is built around a competitive agenda to pursue sporting excellence, whereas the Whiteheadian approach focuses on health. From this, as fundamental movement skills are mentioned within the LTAD model

but not within the Whiteheadian approach, the positioning of these skills to define physical literacy will be looked into further.

2.1.5.2.2 The Positioning of Fundamental Movement Skills

It is evident that the LTAD model is explicit in its positioning of fundamental movement skills, during the FUNdamentals stage, to aid development. However, Giblin *et al.* (2014) allude to the positioning of these skills – as the most important element or indeed the entirety of physical literacy – as highly inappropriate for a concept that ought to be defined by a focus on embodiment. For this reason, what is deemed fundamental to one person or setting cannot by default be assumed fundamental to another. Moreover, de-contextualised and abstracted notions of throwing or balancing, for example, detached from any consideration of where the movement is occurring, who is doing the movement, their experience of that movement, and what consequences it has on the ecological system they are a part of (Renshaw *et al.*, 2010), is a futile objectification of our embodied and dialogical relationship with the world (Jurbala, 2015).

This articulation represents a departure from the definition of physical literacy advanced by Whitehead (2010). This is a concern, as fundamental movement skills (such as hopping, skipping and jumping) focus on progressing physical skills in isolation. This therefore hinders the prospect of holistic development (Whitehead, 2010; Mandigo *et al.*, 2012; IPLA, 2016; Keegan *et al.*, 2016). As such, the positioning of these skills is problematic when engaging with constructing paradigms, as Edwards *et al.* (2016) imply that the position of ‘physical literacy and fundamental movement skills are not synonyms’ (p. 11).

However, according to Edwards *et al.* (2016) one implication is that fundamental movement skills may play a role in a broader programme of physical literacy, as a way of developing the physical domain. However, this implication only resonates if the locomotive,

stability and manipulative strands of fundamental movement are completed in an applied setting (Edwards *et al.*, 2016) where perception and action are coupled (Vickers, 2009; Davids, 2010) and the other attributes of physical literacy are expressed (Whitehead, 2010). Therefore, this could be one method, alongside others, to help develop the physical domain that underpins physical literacy. From this, Edwards *et al.* (2016) argue that ‘the LTAD model can be accommodated within the Whiteheadian approach, but not vice versa’ (p. 10).

On this merit, this thesis questions the LTAD approach as a model to conceptualise physical literacy, as it fails to respond to the embodied nature and longevity of the original construct. Therefore, with the Whiteheadian approach positioned at the forefront of this debate, Keegan *et al.* (2016) call for a periodic framework in order to prevent a relapse of the concept being reduced to its simplest form in future.

2.1.6 A Periodic Framework

To conceptualise Mandigo *et al.*’s (2012) definition (see Appendix 1), Keegan *et al.* (2016) utilised Mendeleev’s (1869) thinking, and adopted a periodic framework to identify the underpinning elements of physical literacy. However, whilst it is unclear of what the domains or elements are, or indeed how many of each there are (Francis *et al.*, 2016; Keegan *et al.*, 2016), these elements can be combined into finite combinations of compounds and mixtures, which in this case represent the demands of different environments. From this, these elements are effectively the smallest meaningful units of analysis (Keegan *et al.*, 2016) – while smaller compounds can be found, this analogy is pitched at this practitioner-friendly level so that pedagogues can identify these elements, in order to construct environments to enhance physical literacy. It is to note that like Mendeleev’s chemical periodic table, it is expected that more elements will be found over time; however, according to Keegan *et al.* (2016), this way of thinking presents an opportunity for academics to stimulate research, public engagement and

further thinking. In regard to this thinking, it is to note that a model built from a different perspective for a different concept, would contain different domains and underpinning elements.

With the definitional debate addressed and the Whiteheadian approach accepted within the literature, the next chapter will apply this concept to the context of educational practice in the United Kingdom.

Part 2: Discussion Concerning Physical Literacy in Practice

In order to comprehend the contextual complexities pertaining to the physical literacy concept, the second part of the literature review is split into the following sub-chapters: applying physical literacy to practice; physical education and school sport policy in the 21st Century; the Coalition's revision of physical education and school sport policy; shifting policy discourse to accommodate physical literacy; applying appropriate pedagogy to unify the concept; shifting pedagogic practice to respond to the shift in policy; and the debate of measuring physical literacy.

2.2.1 Applying Physical Literacy to Practice

Edwards *et al.* (2016) declared that physical education is the most popular contextual association in which physical literacy is developed. However, it is worth noting that 16% of the papers reviewed referred to the concept of sport. From an embodied health perspective, physical literacy can be developed via different forms of exercise (Whitehead, 2010); however, as physical education was the most popular contextual association in the United Kingdom, this entity will be looked into in further detail.

Having analysed the National Curriculum for Physical Education, the emphasis is for all pupils 'to engage and excel in competitive sport' (DfE, 2013: p. 1). In order to adhere to this

policy, physical education is being implemented via a sport-based approach, therefore, physical literacy is conformed to sport on a larger scale than Edwards *et al.* (2016) explicitly declare. The complexity of this is that physical education and sport serve different purposes (Lussier, 2010), as they are two separate entities. On one hand, physical education is a compulsory academic subject for children aged four to 16 (DfE, 2013), therefore, physical education must be inclusive and assessable to all (Sprake and Walker, 2013). On the other hand, sport is skill-based, competitive and often exclusive (Canning, 2007; Sellgren, 2016).

On the premise of getting more children active for longer in order to adhere to the health emphasis of physical literacy, the context of physical education will be examined further by analysing the political landscape that has shaped this educational policy since the beginning of the 21st Century.

2.2.1.1 Physical Education and School Sport Policy in the 21st Century

In 2002 the Labour Government deployed the Department for Culture, Media and Sport (DCMS) along with the Department of Children, Schools and Families (DCSF) to launch the Physical Education, School Sport and Club Link initiative (PESSCL). The plan for PESSCL, supported by funding of £1.5 billion from 2003 to 2008 (DCMS, 2002), was to ‘increase the percentage of school children participating in two hours a week of high quality physical education and school sport to 75% by 2006’ (Braden *et al.*, 2012: p. 2). To deliver this, the Labour Government created a network of 450 School Sport Partnerships (SSP) across England (DCMS, 2002). In combination with the SSP networks, the Labour Government, through PESSCL, set out its guiding principles and its paradigmatic approach to school sport and physical education. On the agenda was physical literacy, which was to be promoted through high quality physical activity and inclusive sport for all. This was geared towards promoting active and healthy lifestyles (Houlihan and Green, 2006). In tandem with this ideology and the

policy programmes that the government had informed, a review and revision of the National Curriculum was ordered in 2007. It is clear that this policy pertained to focus on healthy lifestyles, active youth and the positioning of physical literacy as a core educational principle, whilst also providing the opportunity and provision for organised inter- and intra-school sport for those that desired it.

In 2008, after the initial PESSCL cycle had come to an end, the PESSCL strategy was extended by the Physical Education and Sport Strategy for Young People (DfE, 2008). This was launched in order to develop on the foundations built by the SSP networks and was supported with funding of £755 million, which was to be spent between 2008 and 2011 (DCMS, 2008; DCSF, 2008). The purpose of the Physical Education and Sport Strategy for Young People was to continue increasing the percentage of young children participating in two hours of high quality physical activity per week (DfE, 2008) and to create further opportunities for children to participate in physical activity outside of the classroom. The PESSCL policy programme and the Physical Education and Sport Strategy for Young People statistically delivered unprecedented success (Braden *et al.*, 2012), as the percentage of five to 16 year olds participating in at least two hours of physical education and school sport a week increased from 62% in the academic year 2003/04 to 90% in the academic year 2007/08. However, this policy and strategy was not without its critics. The Labour Government positioned PESSCL as a centralised initiative which was target driven, with the aspiration to unify physical education and sport provision across all schools, to benefit the health of all children. To achieve this, this policy required a considerable expense in order to expose itself across the educational system (Collins, 2013). Furthermore, the Conservatives became concerned about the lack of freedom this gave practitioners, as the necessity to roll out a centralised programme showed a distinct lack of trust to those practitioners who had previously adapted their approach in order to suit the needs of the learner.

2.2.1.2 The Coalition's Revision of Physical Education and School Sport Policy

Labour's departure from government, and the introduction of the Conservative-led Coalition in 2010, engendered major policy change towards the approach of physical education and sport in schools – it is to note that this change was heavily influenced by the proximity of the London 2012 Olympic Games. Led by the Education Secretary, Michael Gove, the Coalition outlined their strategy for physical education and school sport in the document titled '*Refocusing Sport in Schools to Build a Lasting Legacy of the 2012 Games*' (DfE, 2010). This document outlined a number of significant changes, which included the decision to terminate the previous government's Physical Education and Sport Strategy for Young People by discontinuing the annual Department of Education funding of £162 million, including ring-fenced funding for the SSP network by March 2011 (DfE, 2010). In sync with this, the '*Refocusing Sport in Schools*' document announced the dismantling of the PESSCL infrastructure and a new Olympic-style school sport competition structure to replace it, namely the School Games.

This change in strategy was geared towards giving schools the time, freedom and incentive to refocus attention on the provision of providing competitive sport, rather than attending to Labour's imperatives of physical literacy and inclusivity for all. It is to note that this change in direction bought about another curriculum review, of which, is the National Curriculum that is present today (DfE, 2013). The 2013 curriculum for physical education aims to ensure that all pupils develop competence to excel in and engage in competitive sport (DfE, 2013), of which by the end of Key Stage 1, pupils should have developed the fundamental movement skills to be able to engage in competitive and co-operative physical activities (DfE, 2013). This educational context aligns physical literacy with the LTAD model; in doing so it reaffirms the dualistic landscape, which is why the once prominent ontological and epistemological foundations of physical literacy have eroded.

Whitehead's (2010) understanding that participation in physical activity, as value in itself, is becoming less of a priority for policy makers. As such, the non-gifted and non-talented pupils are becoming disengaged with physical education as a subject, and sport as an entity, whilst others often look for excuses not to take part in either (Whitehead, 2010). Furthermore, the government's policy indicates that there is an overzealous connection of physical education towards sport-based competencies and competition, which includes the teaching of fundamental movement skills (DfE, 2013). It is this context that has caused the discrepancy of practitioners to associate physical literacy with that of fundamental movement skills, as practitioners have over-simplified the concept in order to accommodate the requirement of the National Curriculum. Whitehead articulates that this policy, which is geared 'towards high level performance and elitism' (2010: p. 4), lends itself towards a tendency to neglect those pupils that do not have outstanding ability (Whitehead, 2010). On this premise, Sellgren (2016) states that physical education requires a 'radical shake up' (p. 1) in order to respond to 21st Century needs; this is a shake-up away from skill-drill lessons, as physical education should reflect the many ways in which children can express themselves (Sellgren, 2016). For this to be achieved, policy makers and practitioners need to deconstruct the current sport-based, behaviourist model of physical education and reconstruct a playful, inclusive model, where physical literacy is at its heart.

2.2.2 Shifting Policy Discourse to Accommodate Physical Literacy

The need to address this head on is pertinent, as without action our society will become increasingly inactive, placing a raising strain on the National Health Service. Therefore, in order for educational and health policy to correspond with Sellgren's (2016) view, a multi-disciplinary and multi-faceted approach is needed, where the initial focus is on children (Gately, 2010). This is not to say that physical literacy provision is not a necessity for older populations

of society, but by focusing on children of whom are at the start of their lifelong journey, a new generation of educated and healthy individuals can build more positive relationships with physical activity (Whitehead, 2010). As such, these individuals will make better informed decisions about their health – in terms of exercise, sleep and nutrition, and their children's health; therefore, positively perpetuating the cycle.

The Youth Sport Trust (2014) suggests that a decoupling or disentanglement of physical education with sport is more conducive to providing children with a holistic education. It is to note that this decoupling contradicts current policy discourses, however it suggests that competitive sporting concepts are to be left for those that want to engage in them (YST, 2014) and that the space of physical education is to be designed to encourage physical activity, which moves away from sessions structured around sporting competency.

2.2.3 Applying Appropriate Pedagogy to Unify the Concept

Whilst Kirk (2005) offered the argument that physical literacy is not – in itself – a pedagogical model, he later (2013) exemplified the suggestion that the first priority in the development of physical literacy is a pedagogical model that ought to be for the early years. Later, Edwards *et al.* (2016) indicated that 20% of the papers systematically reviewed lacked detail of how to practically apply appropriate pedagogy when operationalising physical literacy. This is a concern, as it is considered vital to implement a pedagogical approach that aligns with the philosophical arches of the concept, otherwise this causes further misalignment. Consequently, Keegan *et al.* (2016) indicate that it is a necessity to justify the development of a new pedagogical model that responds to the process of self-realisation (Whitehead, 2007) and the perpetual enrichment of one's understanding of their environmental interactions. On this note, a pedagogical framework which places the learner at the centre is needed, as the current practice-based, skill development models of physical literacy, which are grounded in

behaviourist pedagogy, are ill-suited to such learning endeavours. Constructivism, however, is a pedagogical paradigm which recognises that ‘understanding is in our interactions with the environment’ (Savery and Duffy, 1996: p. 135). Consequently, this pedagogic approach aligns to the philosophy of the concept. Therefore, if physical literacy is the purpose of physical education curricula (Sprake and Walker, 2013), constructivist ideals must be at the pedagogical heart through which this is met.

Two key theoretical frameworks underpin a constructivist pedagogy, which can be applied to enhance physical literacy development in children: problem based learning (Barrows, 1986) and the pedagogy of play (Broadhead and Burt, 2012). It has been established that physical literacy focuses on the embodied dimension of human existence through enriching experience; as such, these pedagogies afford the opportunity for children to develop their physical literacy and enrich their own self-realisation. In support, Kental and Dobson (2007) suggest that ‘children need time to play freely, to wonder and wander in the environment, to engage the world in their own imaginative ways’ (p. 159) in order to develop their understanding and awareness of how they interact with and within that environment. Thus, the exploratory, flexible and ever-shifting experiences within playful environments are well suited to providing the exploration needed to develop physical literacy at a young age. Furthermore, it is this constructivist, non-linear, approach that allows children to be creative in their solutions, which Sellgren (2016) calls for. Therefore, practitioners are required to create learning environments that foster rich interactions with the environment; as the greater the interactions, the greater one will understand their human potential (Whitehead, 2007).

2.2.3.1 Shifting Pedagogic Practice to Respond to the Shift in Policy

Whilst physical education is becoming the means (Edwards *et al.*, 2016), Whitehead (2013a) implies that physical literacy is becoming ‘the goal be reached’ (p. 42). Therefore, in order to

apply physical literacy to physical education curricula, Canning (2007) suggests placing fun and purposeful play at the centre of this provision. By conceptualising physical education as problem-based through active play, the pedagogy of play can be unleashed (Savery and Duffy, 1996; Moyles, 2005; Barab and Roth, 2006; Lester and Russell, 2008). This allows physical education to be exploratory, investigative and inherently child-centred, as it is the child whom defines the boundaries (or lack of) (Canning, 2007). In addition, purposeful and active play affords the possibility of unleashing the creativity of children, harnessing their urge to explore, know and understand their environment through their body, via interaction with the environment. This provision sits hand-in-hand with embodied health and the development of physical literacy, as espoused through the Whiteheadian approach.

Making this happen not only requires practitioners to be aware of their pedagogic practice, but in a majority of cases will require pedagogues to change their practice; change away from a skill-drill, behaviourist approach towards a non-linear, constructivist play-based approach. This is justified as children learn best when practice becomes facilitatory rather than dictatorial (Barab and Roth, 2006). As such, children are able to take control of their own learning, which occurs in a non-linear and emergent way (Chow *et al.*, 2016). Without this change, it is suggested that society would continue to see the dropout rates in physical activity among children (Designed to Move, 2013), therefore compounding the issue of inactivity and obesity (NHS, 2017).

In order for practitioners to successfully shift their pedagogic practice, an understanding of ecological dynamics is paramount. According to Renshaw *et al.* (2009), practitioners must view their learners as non-linear, dynamical systems adapting to an ever-changing ecosystem. The addition of these theories, to underpin non-linear pedagogy, permits the concept to be applied to practice.

To apply this to practice, all individuals are viewed as a dynamical system Renshaw *et al.* (2009). Systems operate via an input (i.e. sight, touch, hear, smell and taste) to generate an output (or a decision), therefore, the input perceived by the system, allows the individual to self-organise and produce an output (Davids *et al.*, 2008; Osberg and Biesta, 2010; Renshaw *et al.*, 2009, 2010; Chow *et al.*, 2016). Facilitating environments that afford individuals the opportunity to self-organise, and in doing so, create action and perception couplings (Davids, 2010), allows for implicit learning to take place (Passos *et al.*, 2010). Furthermore, creating a curriculum that is framed around interesting or realistic problems creates a student-environment ecology (Barab and Roth, 2006), rather than a drill-based practice which is imposed upon them via direct instruction from the teacher and has no meaning.

It is to note that when the problem becomes stable (i.e. the child has solved/completed the problem) it is the responsibility of the practitioner to regenerate instability in the learning environment, so that further learning and self-development can occur. Creating instability can be achieved in a number of ways, for example altering the parameters of the environment (Chow *et al.*, 2016; Renshaw *et al.*, 2010). This change requires the learner, who is at the centre of the learning environment, to adapt their behaviour to respond to the changes in the environment. This therefore corresponds with Whitehead's (2007) existentialist epistemology, as first the learner cannot adapt to an environment that they do not inhabit (Davids *et al.*, 2008) and, second, the richer the interactions with the environment, the greater one will understand their human potential (Whitehead, 2007; Edwards *et al.*, 2016), therefore further developing their physical literacy.

Once academics, policy makers and practitioners are aware of the elements that underpin physical literacy, these groups can work together to design meaningful physical education curriculums that not only respond to the needs of 21st Century, but also foster physical literacy development in children.

It is this notion of development that hints at the final hurdle, that the concept needs to take, before physical literacy can embed physical education curricula in the United Kingdom. Therefore the debate of measuring/charting the concept will be looked at in the next sub-chapter.

2.2.4 The Debate of Measuring Physical Literacy

Assessment and evaluation are fundamental to educational and health fields; therefore, if physical literacy is to be associated with educational policy, it is apparent that appropriate metrics must be in place to evaluate the concept (Tremblay and Lloyd, 2010). These results can be used at multiple levels to identify areas of success and improvement; for example, teachers can use the results to inform their planning of physical education lessons. Headteachers and governors can use the data to seek resources to raise the physical literacy levels of their pupils, whilst non-government groups can use the information to put pressure on politicians and policy makers to enact positive change (Tremblay and Lloyd, 2010). Therefore, such measures will identify areas for improvement and in doing so elevate the status of physical literacy, which is needed given the growing rates of obesity in both adults and children (NHS, 2017). However, this initiates a problem, as physical literacy, as espoused by Whitehead (2010), seemingly stands in stark contrast with the ideologies of measurement and assessment (McCaffrey and Singleton, 2013; Tompsett *et al.*, 2014; Lundvall, 2015). As such, this could be an additional reason as to why organisations have conformed the concept to dualistic parameters.

Lundvall (2015) is one of few to have recognised a tension that exists when physical literacy is subject to summative evaluations (see also McCaffrey and Singleton, 2013; Tompsett *et al.*, 2014). This is because assessment is restrictive, oppressive and exclusionary; therefore, it is seemingly juxtaposed to physical literacy (Whitehead, 2010, 2013b, 2013c), which is understood as an individual disposition governed by self-awareness (Whitehead, 2010; Taplin, 2012). Existing literature indicates that there is a dearth of research that pertains to conquering

this juxtaposition (Robinson and Randall, 2017), as Tremblay and Lloyd (2010) signify that there is no comprehensive or valid assessment tool to measure physical literacy provision. This is because physical literacy is not defined by measurable performance outcomes, skill acquisition or sporting benchmarks (Jurbala, 2015). That said, this absence is limiting the adoption of the concept as a national approach (MacDonald and Enright, 2013), as it is considered that, in order to be incorporated within educational and health policy, it must adhere to its measurable landscape.

Since Tremblay and Lloyd (2010) signalled an absence of protocol, the *Canadian Assessment for Physical Literacy* (CAPL), the *Passport for Life* and the *Physical Literacy Assessment for Youth* (PLAY) have been designed as tools to measure the physical literacy level of individuals (Longmuir, 2013; Robinson and Randall, 2017). These protocols are analysed in Appendix 2. Furthermore, as 72% of the articles systematically reviewed by Edwards *et al.* (2016) revealed a monist ontology and a phenomenology epistemology, Appendix 2.1 identifies the fidelity of these protocols to the Whiteheadian approach. Please note that whilst this review acknowledges that other forms of physical assessment protocols are evident this thesis ignores these, as they do not explicitly refer to physical literacy.

2.3 Summary of Literature

To summarise, it is evident that over the course of two decades, the concept of physical literacy has been through considerable evolution. Originating from debates pertaining to existentialism and phenomenology, the concept has since begun to forge itself as an outcome of physical education curricula around the world. However, as this field is governed by dualistic parameters, its epistemological pillars have become muddled, resulting in competing definitions existing. These exist due to the effort to make the concept practitioner-friendly. In

achieving this, the LTAD approach emerged, but this approach reduces physical literacy to its simplest form – fundamental movement skills.

As a result, physical literacy is no longer viewed as an inherent human capacity, but rather a discrete set of isolated skills to be taught and evaluated. The argument is that this reductionism is the result of an absence of an applicable and tangible pedagogic framework. Therefore, as current literature contains different representations of the physical literacy concept, it is clear that its definition, conceptual underpinnings and measurement are three foundational issues pertaining to the concept that lack consensus.

What is needed then is to reverse this trend of reductionism, whilst attending to the demand to make the concept practitioner-friendly. The difficulty is reaching this without shying away from the ontological imperative of embodiment. Therefore, to achieve this, the aim of this thesis is to gain consensus on the definition, domains and elements of physical literacy. In doing so, this allows for an applicable pedagogic framework to be created. This framework is needed in order to respond to the calls, identified in the literature, to make the concept practitioner-friendly; however, it must also attend to the original philosophical pillars, espoused by Whitehead. Furthermore, as the fields of education and health are governed by metrics, a by-product of this literature review informs this study to look into re-establishing the academic debate of measuring the concept, thus this will allow the concept to move into mainstream education and health policy in the United Kingdom.

Note: Epistemological Assumptions

Existentialism, phenomenology, monism, and dualism were the only philosophies offered in the papers reviewed by Edwards *et al.* (2016). Therefore, with no alternative approaches relating to the overarching philosophy available, in terms of rethinking it is apparent to consider how physical literacy would be operationalised under different assumption sets such as

empiricism, post-positivism and critical realism to see if physical literacy could lend itself to objective testing of effectiveness (Edwards *et al.*, 2016) for example. Therefore these alternative epistemological considerations are addressed in this study.

3.0 Methodology

The Delphi technique is an iterative process, which is designed to combine expert opinion into group consensus (Lynn *et al.*, 1998; Keeney *et al.*, 2001; Hsu and Sandford, 2007). This method uses a series of intensive surveys which are interspersed with controlled feedback (Dalkey and Helmer, 1963). Sumsion (1998) describes this as a multistage process, where each stage builds on the results of the previous round. The Delphi begins with an initial set of open-ended questions, which act to uncover the issues pertaining to the topic under investigation (Keeney *et al.*, 2001). The panellists then put forward as many relevant issues as possible in Round One as these responses inform the rest of the process. Round Two is then designed following the results of Round One. Feedback from Round One is provided in the form of a second survey and opinion is asked of the questions raised. In these subsequent rounds, the panel members are provided with their own responses to the previous round, as well as a summary report of that round containing the group's responses. This provides the panellists with the option of reconsidering their original response. Therefore, if they wish, they can change their opinion in light of the groups responses. Normally, this process continues for three rounds until consensus is obtained (Keeney *et al.*, 2001). Hsu and Sandford (2007) indicate that the Delphi has become widely accepted within social science and health research, as it is used 'to either develop a full range of alternatives, explore or expose underlying assumptions, or correlate judgements on a topic spanning a wide range of disciplines' (p. 1).

According to Hanafin (2004) the epistemological assumptions for the Delphi technique favour the positivist paradigm. This paradigm assumes the position of the researcher within the research to be that of an objective and uninvolved observer (Robson, 1993; Jones, 2015). However, it is to note that the objectivist position in the Delphi technique is supported through the utilisation of a quantitative approach to data collection and the application of single statistical measures to the identification of consensus (Hanafin, 2004). Furthermore, the

inclusion of experts assumes an ontological position of single reality (on which experts agree) which could also be understood as adhering to positivistic principles (Blackburn, 1999; Monti and Tingen, 1999). In contrast, Fitzsimmons and Fitzsimmons (2001) present the Delphi technique as subjective and qualitative in nature. Nevertheless, the process itself is concerned with opinions and ideas (Stewart, 2001) and it is suggested by Fitzsimmons and Fitzsimmons (2001) that the purpose of the methodology, which is to achieve consensus through group interaction (Dakley and Helmer, 1963), is in keeping with an interpretive paradigm.

It is to note, that within an interpretive paradigm there can be many differing constructs which include post-positivism, critical theory, constructivism and participatory paradigms (Lincoln and Guba, 2000). However, Fitzsimmons and Fitzsimmons (2001) suggest that constructivism appears to have the most to offer in terms of understanding the epistemological assumptions as: a) the advantage of the Delphi technique is the acknowledgement of the unique contribution of each participant; and b) the process of individual feedback about the group responses – with opportunities for panellists to change their position, primarily on the basis of that feedback – provides a close fit to overcome the epistemological assumptions.

With the ontological and epistemological assumptions expressed, the sub-chapter will look into the methodology of constructing a Delphi.

3.1 Sampling and the Use of ‘Experts’

The Delphi does not use a random sample group; instead it contains a group of experts, who are identified by the research team prior to the investigation. Therefore, the first stage of the process is to decide who to invite onto the expert panel. Judd (1972), Taylor and Judd (1989), and Jacobs (1996) consider that this subjective process, of choosing appropriate panellists, is the most important step in the entire process as this could relate to the quality of results obtained.

However, Hsu and Sandford (2007) view the use of experts with caution, as the term expert is debatable. The Oxford Dictionary (n. d) defines an expert 'as a person who is very knowledgeable about, or skilful in, a particular area'. This raises methodological concerns (Sackman, 1975; Linstone and Turoff, 1975; McKenna, 1994; Hsu and Sandford, 2007), in that, just because an individual has knowledge of a particular topic, this does not necessarily equate them as being an expert (Keeney *et al.*, 2001; Hsu and Sandford, 2007). Therefore, the claims that a Delphi represents valid expert opinion has been criticised as scientifically untenable and overstated (Strauss and Ziegler, 1975; Hsu and Sandford, 2007).

It is to note that 'there is no exact criterion currently listed in the literature' (Hsu and Sandford, 2007: p. 3) in regard to a set of standards for selecting Delphi participants. This viewpoint emulates Kaplan's (1971) standpoint that 'throughout the Delphi literature, the definition of [Delphi expertise] has remained ambiguous' (p. 24). Therefore, having noted this, the criteria used to guide the selection of Delphi participants seems somewhat varied, as individuals are considered to be eligible to participate if they have related backgrounds and experiences concerning the target issue (Pill, 1971). Helmer and Rescher (1959), Klee (1972), and later Oh (1974) concur that choosing individuals who are simply knowledgeable in the target issue is not sufficient nor recommended. Therefore, considering the necessity of selecting the most qualified participants, investigators need to closely examine and carefully consider the qualifications and expertise of Delphi panellists (Hsu and Sandford, 2007).

Oh (1974) indicates that choosing appropriate panellists is generally based on the judgement and discretion of the principal investigator(s), whilst Jones and Twiss (1978) indicate that the principal investigator(s) should identify and select the most appropriate individuals via a nomination process. Furthermore, Meyer (1992), and later Miller (2001), state that this is best achieved following a review of authors and their publications relating to the pertinent literature.

The use of experts has gained further criticism (Green *et al.*, 1999; Ludwig, 1994; Hsu and Sandford, 2007) in that the number of experts used is generally determined by the number required to constitute a representative pooling of judgements. However, what constitutes an optimal number of panellists in a Delphi study ‘never reaches a consensus in the literature’ (Hsu and Sandford, 2007: p. 3). Delbecq *et al.* (1975) suggest that 10 to 15 panellists could be sufficient if the background of these participants is homogenous. In contrast, Hsu and Sandford (2007) indicate that if various reference groups are involved in the Delphi, more panellists are anticipated to be needed. However, if the sample size is too large then there is a potential requirement for more time to be consumed by the panellists, as this may result in additional rounds needed in order to gain consensus.

3.2 Time Requirements

Conducting a Delphi study can be time consuming for panellists, specifically when there is a requirement to complete a large number of statements in the form of open ended questions. Panellists will therefore need to dedicate large blocks of time to complete each round. Delbecq *et al.* (1975) recommend that a minimum of 45 days is required for the administration of the study. With regards to the allotted time for panellists to complete each round, Delbecq *et al.* (1975) suggest that two weeks is encouraged.

Ensuring panellists respond to the investigators on time can promote or prohibit the ability of the investigators. This is in regard to analysing the data, developing the corresponding round (which is based upon the prior responses) and distributing the round in a timely fashion. These are challenging aspects to consider when conducting a Delphi; therefore appropriate planning and time management is required. To overcome this, various GANTT charts were designed and used by the Principal Researcher.

3.3 Reliability, Validity and Low Response Rates

The Delphi has been criticised as having no evidence of reliability. For example, if the same study was conducted with a different set of panel members, there is no guarantee that the same results would be obtained (Williams and Webb, 1978; Walker and Selfe, 1996). Although this maybe the case, the process is well suited to seek information, which may generate consensus of the respondent group (Hsu and Sandford, 2007). In addition, the technique has been criticised in relation to validity, as Goodman (1987) states that the researcher can add their own bias to the topic under investigation. However, Goodman also implies that as the researcher conducting the study is representative of the group, then content validity is assumed.

Due to the multiple round process, the reliability and validity of the results could be discredited if response rates drop. This is a concern if consensus is obtained following a certain percentage agreement amongst panellists. For example, if consensus is defined as 75% agreement among panellists, and 16 panellists complete Round 1, but two drop out – the figure to obtain consensus would drop from 12 panellists having to reach agreement to 11. As such, Ludwig (1994) implies that subject motivation is the key to the successful implementation of the Delphi and researchers need to play an active role in this to ensure that as high a response rate as possible is maintained. To combat this, the percentage of panellists that complete all the rounds must be greater than 75%.

3.4 Anonymity

Anonymity provides each panellist an equal chance to present and react to ideas presented to them and prevents the identities of the other panellists influencing their responses (Goodman, 1987). Responses are given independently so that each opinion carries the same weight; therefore, each response is given the same importance in the analysis (Keeney *et al.*, 2001).

This promise of anonymity facilitates respondents to be open and honest of their views on certain topics. However, Keeney *et al.* (2001) state that it is unclear as to whether panellists in a Delphi change their viewpoint on the basis of new information or despite the protection of anonymity, feel pressured into conforming with the groups opinion. Nevertheless, the aim of such study is to correlate judgements on a topic.

It is to note that complete anonymity cannot be guaranteed, as firstly the researcher knows the panel experts, and can see their responses. Secondly, it is often the case that panel members know each other. However, this is overcome by coding the data and assigning a unique identification number to each panellist (Hsu and Sandford, 2007). Therefore, anonymity between each panellist remains.

3.5 Data Analysis

Regarding the analysis of a Delphi, decisions are made to assemble and organise the judgements and insights provided by the panellists. In this context, data can involve both qualitative and quantitative methods (Jones, 2015), as researchers need to deal with qualitative data from questions that use open-ended and text entry formats to formulate panellists' opinions, whilst the use of Likert-scale questions promotes qualitative frequency tabulations. In order to present the information concerning the collective judgments of panellists, Hsu and Sandford (2007) indicate that the median and mode are generally favoured. However, Murray and Jarman (1987) indicate that the mean is also workable. Having analysed the tendencies used in previous Delphi studies (see Witkin, 1984; Ludwig, 1994; Jacobs, 1996; Hasson *et al.*, 2000) the mean is taken forward, on the premise that scales are lineated at equal intervals.

The qualitative data is typically analysed using inductive content analysis (Patton, 1990). Inductive analysis is a qualitative method that allows researchers to develop theory and identify themes that emerge from the raw data (Jones, 2015). This approach is well suited for

research where few or no previous studies of the phenomenon in question exist (Patton, 1990). As such, this approach enables researchers to identify key themes in the area of interest by reducing the material to a set of themes or categories. It is to note that inductive content analysis begins with coding the raw data through open-coding (Patton, 1990). This process requires the researcher to read the material and transcribe the notes onto a coding sheet (Jones, 2015). The next step involves grouping the data, reducing the number of categories by combining similar headings into broader categories (Jones, 2015). Through this process, researchers generate knowledge and increase understanding of the material. Finally, coding is an analytical process to categorise quantitative and qualitative data to facilitate analysis (Jones, 2015); therefore, the purpose of this is to translate the data into a form suitable for computer-aided analysis.

3.6 Consensus

Consensus is defined as agreement among $\geq 75\%$ of the panel (Francis *et al.*, 2016). This percentage figure aligns to previous studies that have been conducted in health-related fields (see Palisano *et al.*, 1997; Bulger and Housner, 2007; Francis *et al.*, 2016).

It is noted that the consensus from a Delphi process does not mean that the correct answer has necessarily been found, nor does consensus mean a 100% agreement amongst experts; as this may be difficult to attain with panellists representing different viewpoints and priorities (Keeney *et al.*, 2001). Instead, Delphi consensus ranges from 55 to 100% agreement, with 75% considered the standard (Vernon, 2009).

As a result, this method cannot ignore or replace vigorous scientific reviews of published reports that have gone before, but it can converge opinion which can then be taken forward to challenge current policy makers. Furthermore, the Delphi has been criticised as a method which forces consensus and is weakened by not allowing panellists to elaborate on their views (Goodman, 1987; Walker and Selfe, 1996). However, as long as these issues are

kept in mind and are addressed, consensus can be gained and the Delphi can be used as a ‘useful, integral consensus technique’ (Keeney *et al.*, 2001: p. 198).

It is clear from reviewing the advantages and criticisms of the Delphi process, that the arguments are no stronger or no more valid on one side than the other; therefore, this technique must be evaluated against the proposed study and advantages over other methods obtained.

3.7 Method: *The Case for a Delphi*

The Delphi is accepted as the method on four grounds. First, the Delphi has previously been used as the method for similar studies in physical literacy (see Keegan *et al.*, 2016 and Francis *et al.*, 2016). The approach is used to ‘explore and expose underlying assumptions, and correlate judgements on a topic spanning a wide range of disciplines’ (Hsu and Sandford, 2007, p. 1); therefore, from the literature review, it is evident that physical literacy spans a wide range of disciplines in that it incorporates physical education, sport participation and physical activity as means to improve health (Whitehead and Almond, 2013), and the concept is attributed with underlying assumptions that stem from philosophical groundings (Edwards *et al.*, 2016). Second, the Delphi is an iterative process, designed to combine expert opinion into group consensus (Lynn *et al.*, 1998; Keeney *et al.*, 2001; Hsu and Sandford, 2007); therefore, whilst Goodman (1987) and Walker and Selfe (1996) expressed their concerns that this method forces consensus, the research team committed themselves to being accessible by allowing panellists to elaborate on their views via email. Third, physical literacy is an international concept, therefore the Delphi accommodates the geographical location of the panellists. It is to note that although the geographical location could have been accommodated by telephone/Skype interviews, the benefit of an online survey allows the content of the study to be consistent with each panellist (Francis *et al.*, 2016; Keegan *et al.*, 2016). Finally, as the surveys are online, this allows the panellists to complete their response to each round in their own time, wherever their

location in the world (given that they have wi-fi), within the given timeframe. Therefore, on these four groundings, the Delphi is the suitable method in this context to gain consensus on the definition, domains and elements of physical literacy.

3.7.1 Participant Welcome Letter and Ethics Form

An E3 Ethics proposal form (Appendix 3) was submitted in accordance with Oxford Brookes University's Postgraduate Research Degrees regulation. This research proposal was reviewed and accepted at Departmental level by the Research Ethics Officer, in the Faculty of Health and Life Sciences, Department of Sport and Health Sciences. Once the study was granted full ethical approval, the commencement of the Delphi could begin.

A Participant Welcome Letter (Appendix 4) was sent via email to the 20 identified experts on the 21st March 2017. This letter outlined the proposed study. The experts then had 7 days to respond to the letter. Those that responded and expressed interest were sent an electronic link to Round 1 (Appendix 5.1) on the 29th March 2017. Participant information along with a consent form was attached to each round (see Appendix 5.1, 5.2 and 5.3 for further details of each round).

3.7.2 Delphi Panellists

Physical literacy is an international concept; however, panel members that possessed English fluency was a participation criterion. This was made on two grounds. First that this corresponded with the language of the Principal Researcher and second, English was the language being used to write up the study.

Furthermore, in correspondence with Delbecq *et al.* (1975), 20 experts were invited to participate in this study. Academic experts were identified via the SPORTDiscus database using the search terms *physical literacy*, *physical activity* and *child development*, whilst practitioner

experts were identified via blog posts. The split of academics to practitioners was 75% to 25%, and the Principal Investigator was the gatekeeper to all panellists.

To relate to Meyer's (1992) and Miller's (2001) recommendations, this study defines an expert as an informed individual who is a specialist in their field. The characteristics presented in Table 1 depict the panellists that participated in the Delphi; therefore, these characteristics can be used to replicate this study in future.

Table 1: Characteristics of the Panellists that Participated in the Delphi Study.

Characteristic	Description	Number
Sex	Male	13
	Female	7
Location	Australia	2
	Canada	2
	New Zealand	2
	United Kingdom	14
Area of Expertise	Human Movement	1
	Pedagogy	1
	Physical Activity	2
	Physical Education	5
	Physical Literacy	8
	Psychology	1
	Skill Acquisition	1
	Sociology	1
Career length	Sum	297 Years
	Average	14.85 Years
	Range	5 – 35 years
Number of publications	Sum	1075
	Average	53.75
	Range	0 – 400

It is to note that whilst physical literacy is an international concept, the justification for a large proportion of panellists being from the United Kingdom is made on the grounds that this thesis is primarily investigating physical literacy in the context of the United Kingdom.

3.7.3 Delphi Pilot

Prior to sending the first round to the panellist experts, it was agreed by the research team that a pilot study would be conducted with a sample group. The characteristics presented in Table

2 depict the pilot sample. Please note that these four panellists also completed all three rounds of the study.

Table 2: Characteristics of the Panellists that Participated in the Pilot Study

Characteristic	Description	Number
Sex	Male	3
	Female	1
Location	Australia	1
	Canada	1
	United Kingdom	2
Area of Expertise	Physical Literacy	3
	Sociology	1
Previous Experience of Delphi	Yes	2
Career length	Sum	60
	Average	15 Years
	Range	5 – 35 years
Number of publications	Sum	119
	Average	29.75
	Range	15 – 35

The pilot (Appendix 5) was deemed a success as the feedback received from the sample group indicated that the format was accessible and the length of the survey appropriate. The data collected from the pilot gave an indication of the logistics of analysing the data. The format of questions heavily influenced this, as questions presented in the pilot used *text entry* and *single/multiple choice*. A *matrix table*, and *rank order* format were also used, but the raw data that this produced were not easily accessible to analyse. Therefore, moving forward, the Delphi consists of text entry and single/multiple choice questions for: a) accessibility for panellists; and b) practicality of collating and analysing the raw data.

3.7.4 Delphi Design

Qualtrics Online Survey Solutions (www.qualtrics.com) was the survey provider used in this study, as first the Department of Sport and Health Sciences at Oxford Brookes University had a premium membership; therefore, access to Qualtrics was free as there was no registration or

membership fee. Second, Qualtrics is compatible on tablet devices and mobile telephones, therefore this aided the practicality for the participants to complete each round. Third, Keegan *et al.* (2016) conducted their Delphi study using the same software; therefore, as Qualtrics had been accepted in previous research, it is valid to use this survey provider as the tool for conducting this study.

It is to note that the formulation of the questions in Round 1 were devised from the literature review, which includes the core-categories identified in Edwards *et al.*'s (2016) systematic review and the analysis of current definitions, as presented in Appendix 1. Due to the nature of the Delphi method, the subsequent rounds were designed following the results of Round 1 (Keeney *et al.*, 2001).

3.7.5 Delphi Process

The aim of this process was to reach a consensus after three structured rounds of discussion. For this project, consensus was defined as agreement among $\geq 75\%$ of the panel. Each round was conducted electronically, using an online secure website, between March 2017 and June 2017. To resonate with Delbecq *et al.* (1975), the duration of each round was two weeks, therefore the involvement of the participants was a period consisting of six weeks. Individual reminder emails were sent three days in advance to the participants of whom were yet to complete the round. If a panellist did not respond to a round within the given deadline, an extension of up to 10 days was allocated for. However, if no response had been made after this extended period then they were withdrawn from the study.

3.7.6 Data Analysis

The panellists were assigned a unique identification number to maintain response anonymity. The results from each round were analysed using inductive content analysis (Patton, 1990;

Francis *et al.*, 2016). Microsoft Excel was used to assist. Detail of the coding process in each Round is provided in sections 3.7.7.1, 3.7.8.1 and 3.7.9.1. Following each round, the data was collated into a summary report. Following the completion of the three rounds, a consensus statement was distributed to the panellists that completed the study. This gave the panellists the option to be acknowledged in the write up, and undersign the results. Figure 5 summarises the procedure undertaken.

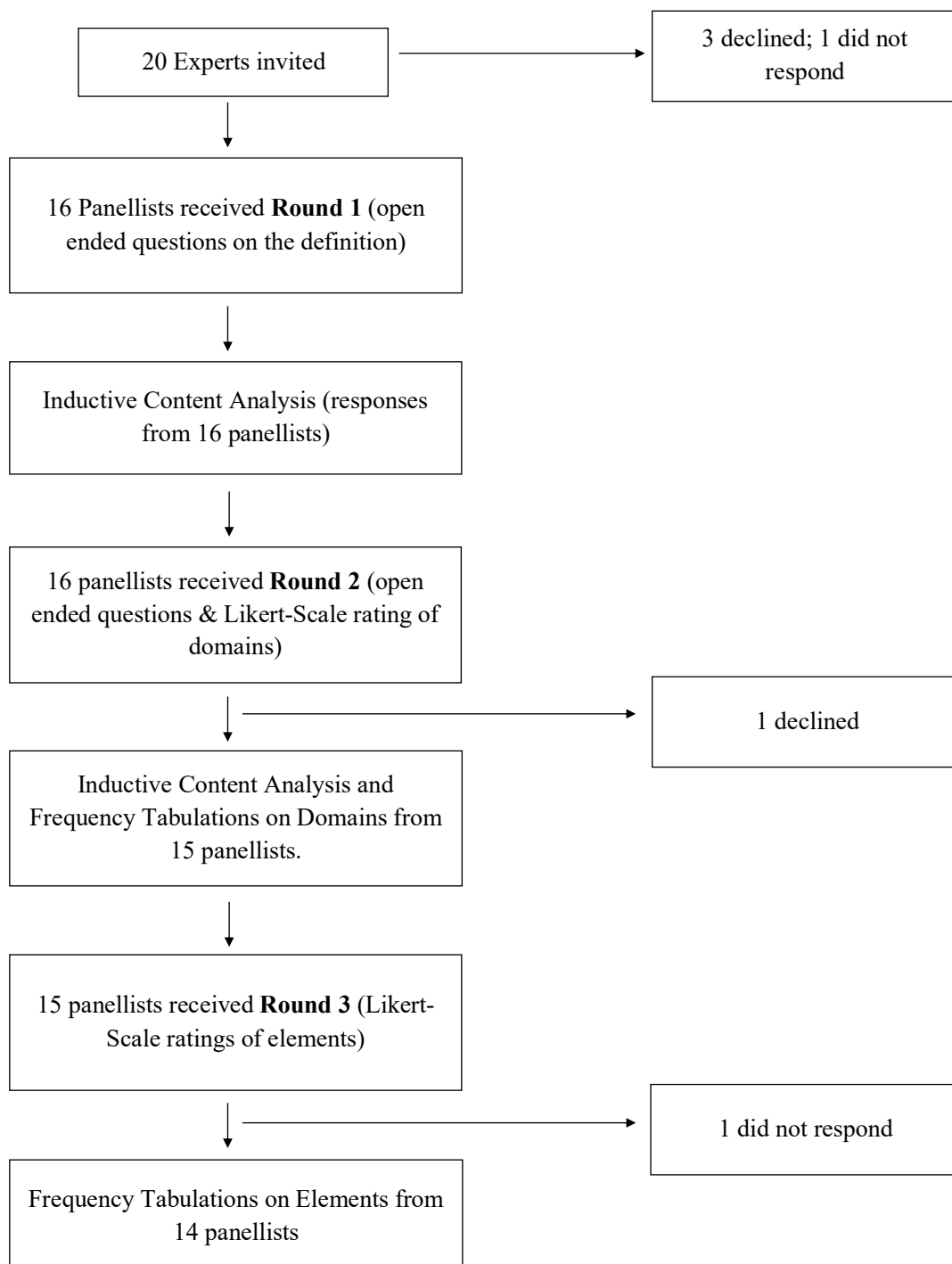


Figure 5: Procedure of Delphi

Throughout the duration of the study, the completed surveys were stored on the software providers website under password protection. Furthermore, the coded data was stored on a password locked computer, and Oxford Brookes University Data Protection policies were adhered to at all times during the study.

3.7.7 Round 1

Round 1 included 5 open-ended questions. The questions set to identify the definition of physical literacy. The goal was to gather expert opinion on the conflict between definitions and to allow the panellists to highlight the perceived strengths and weaknesses of the definition that they provided. The relative importance of philosophy was asked in the latter part of the survey. Table 3 provides a summary of the questions presented in Round 1 (see Appendix 5.1 for a full copy of Round 1 that was sent to the panellists).

Table 3: List of Round 1 Questions

Question 1	How do you currently define Physical Literacy?
Question 1.1	What are the strengths of the definition that you have provided?
Question 1.2	What are the weaknesses of the definition that you have provided?
Question 1.3	In your opinion, is the definition that you have provided process or outcome driven?
Question 1.3.1	Please provide reasoning to support your answer to why PL is process driven (only applicable to the panellists that select the applicable answer to Q1.3)
Question 1.3.2	Please provide reasoning to support your answer to why PL is outcome driven
Question 1.3.3	Please provide reasoning to support your answer to why PL is both process and outcome driven
Question 1.3.4	Please provide reasoning to support your answer to why PL is neither process or outcome driven
Question 2	In your opinion, are there any assumptions made when defining Physical Literacy?
Question 2.1	In your opinion, what are these assumptions?
Question 2.2	Please comment as to why there are no assumptions made when defining Physical Literacy
Question 3	From your experience, please indicate from the list, which of the following are core to your definition of Physical Literacy?
Question 3.1	In your opinion, are there any notions that are core to the definition of PL that are missing? Please justify.

Question 4	In your opinion, which philosophical underpinnings (if any) are core to the definition of Physical Literacy?
Question 4.1	In your opinion, are there any philosophical underpinnings that are core to the definition of PL that are missing? Please justify.
Question 5	Identify, from the given list, the domains (if applicable) that relate to your definition of Physical Literacy?
Question 5.1	As you selected other, please comment to justify your answer (only applicable to these panellists that select 'other')

3.7.7.1 Coding the Data in Round 1

Due to the nature of the questions in Round 1, the questions in Table 3.1 required coding. Note that as questions 1.3 and 2 are *single answer* format, and 5 a *multiple answers* format, the quantitative data from these questions did not require coding. The other questions provide justifications and as these are not applicable to the wider study they have been left blank.

Table 3.1: Coding of the Answers in Round 1

Question	Lower order theme	Higher order theme
1	Motivation	Affective
	Confidence	Cognitive
	Knowledge and understanding	Physical
	Competence	Social
	Social	
1.1	For life, throughout time, stable, established	Lifelong
	Influence, interact	Interaction
	Entwine, integration, interconnected, interdependent, reciprocal	Holistic
	Confidence, motivation	Affective
1.2	PL = physical, FMS, competency	Physical domain
	Complex, difficult to understanding/apply to practice	Difficult to comprehend
	Requires further explanation	Requires further explanation
1.3	n/a	n/a
1.3.1		PL is a journey/lifespan
		Includes everyone
		Can be achieved in different ways
1.3.2		Goal
		Outcome of activity
1.3.3	Journey, evolving, disposition, innate, means, holistic	Process
		Outcome

	Competencies, takes care of itself, requires the ability	
1.3.4	-----	-----
2	n/a	n/a
2.1		Understanding/‘Literacy’ Physical/FMS What is the purpose Context
2.2	-----	-----
3	-----	-----
3.1	-----	-----
4	-----	-----
4.1	-----	-----
5	n/a	n/a
5.1	-----	-----

3.7.8 Round 2

Round 2 was designed to overcome the complexity pertaining to the definition that was highlighted in the literature review. Question 1 was a single-answer matrix. Following this, panellists were asked to discuss the elements that underpin the domains that had been identified in Round 1; the use of open text was used to allow the panellists to record their justifications. Table 4 summarises the questions in Round 2 (see Appendix 5.2 for a full copy of the Round that was sent to the panellists).

Table 4: List of Round 2 Questions

Question 1	Which of the following definitions best defines Physical Literacy?
Question 2	Does the definition of Physical Literacy require further explanation?
Question 2.1.A	Which of the following best supports your answer?
Question 2.1.1	Please comment as to what this ‘further explanation’ might consist of?
Question 3	The report from Round 1 indicates that 64% of responses selected four domains to underpin the definition of PL. Do you: a) agree with the use of the 4 domains to underpin the definition; b) agree – but with some changes – to the use of domains to underpin the definition; c) disagree and propose the use of a different learning approach.
Question 4	Identify the elements that underpin the learning domains (Affective, Cognitive, Physical, Social)
Question 5	Does Physical Literacy have an outcome?
Question 6	Should Physical Literacy be measured?

Question 6.1	Please give reasoning as to why PL should be measured
Question 6.2	Please give reasoning as to why PL should maybe be measured
Question 6.3	Please give reasoning as to why PL should not be measured

3.7.8.1 Coding the Data in Round 2

Due to the nature of the questions in Round 2, the questions in Table 4.1 required coding. Please note that questions 1, 2, 2.1.A, 3, 5 and 6 were either *single* or *multiple choice answers* therefore this data was already in a computer-aided format and therefore did not require coding. Question 6.3 was a justification and as this is not applicable to the wider study it has been left blank.

Table 4.1: Coding of the Answers in Round 2

Question	Lower Order Theme	Higher Order Theme
1	-----	-----
2	-----	-----
2.1.A	-----	-----
2.1.1	Further explanation	'Physical' misinterpreted Clarify different definitions, conceptualisations and philosophical underpinning Apply to practice Reach out to different audiences
3	-----	-----
4	See Appendix 5.2.2	-----
5	-----	-----
6	-----	-----
6.1	Individual development/Educate Identify success of intervention/policy Data to inform policy makers	Should measure
6.2	Individual, progress/development, identify success of interventions / assist policy makers It cannot be reduced, results may be skewed by metrics that are not understood	Should measure Should not measure
6.3	n/a	n/a

3.7.9 Round 3

Round 3 was designed to rank the elements and discuss how these elements might be measured. To do this, the elements that had been recorded in Round 2 were recirculated using a Likert-scale (agree, disagree, not applicable). Each participant received their previous response as well as a summary report of the group's responses. This was so that they could confirm or alter their original response. Table 5 provides a summary of the questions presented in Round 3 (see Appendix 5.3 for a full copy of the Round that was distributed to the panellists).

Table 5: List of Round 3 Questions

Question 1	Do you agree with IPLA's definition to define Physical Literacy?
Question 2	Do you agree that Physical Literacy is a process, and that it has an outcome?
Question 3	Do you agree with the 4 Learning Domains – Affective, Cognitive, Physical and Social?
Question 4	Do you agree with the following underpinning Elements in the Affective Domain?
Question 4.1	Do you agree with the following underpinning Elements in the Cognitive Domain?
Question 4.2	Do you agree with the following underpinning Elements in the Physical Domain?
Question 4.3	Do you agree with the following underpinning Elements in the Social Domain?
Question 5	How would you measure, chart or track Physical Literacy Development?

3.7.9.1 Coding Round 3 Data

The questions to Round 3 were in the form of *single choice answers* therefore as Qualtrics presented this in Excel the data did not need coding.

4.0 Results and Data Analysis

From the 20 experts that were invited to participate, 3 declined and 1 did not respond. As a result, 16 panellists were sent Round 1. From this, 14 panellists (87.5%) completed all three rounds of the study. Despite one panellist declining their involvement following Round 1 and another not responding to Round 3, consensus was reached on the definition, domains and elements of physical literacy. In addition, this study acquired three by-products. The first identified the overarching philosophy, the second identified the concept as being a process, as well as having an outcome, and the third, that the concept should be measured.

With this achieved, this section will analyse the results obtained from the three rounds and will be split into four sections: definition, domains, elements, and by-products.

4.1 Definition

The first aim of this study was to gain consensus on the definition. Question 1, Round 1 asked *how do you currently define physical literacy*. As a result, the lower-order themes of motivation, confidence, (physical) competence, knowledge and understanding appeared in 13 responses (81.25%). Two panellists (12.5%) used the terminology of higher-order themes (or in addition provided the terminology) which included physical, cognitive, affective and social.

With regard to the panellists' perceived strength of the definition that they had provided, 11 responses (68.75%) attributed the higher order theme of affective underpinnings (e.g. confidence, motivation and value) with the sense of maintaining physical activity levels. In addition, the higher-order themes of holism (or integration of constituent parts) and interaction (between self and the environment) were recorded in nine responses (56.25%). Finally, seven panellists (43.75%) attributed the higher-order theme of longevity (i.e. journey) with their definition.

On the other hand, when asked to respond to the perceived weaknesses of their/the definition, 12 panellists (75%) noted the higher-order theme of difficulty to understand/complexity. This sense of complexity personifies the reference made in the literature review of the concept being too academic and there being a misunderstanding of the term literacy. In addition, eight panellists (50%) indicated that physical literacy requires some form of further explanation, for example, how to translate physical literacy into practice; whilst five panellists (31.25%) identified there being an over emphasis on fundamental movement skills. It is to note that one panellist (6.25%) indicated to there being no weaknesses with their/the current definition of physical literacy.

In response to 75% of panellists identifying the concept as complex, question 2 in Round 2 asked whether or not physical literacy requires further explanation. 14 panellists (93.33%), out of 15 – because one panellist declined – agreed that physical literacy requires further explanation. Their reasoning is highlighted in figure 6. From these 14 panellists, 13 (92.86%) indicated that physical literacy requires further explanation because it is difficult to translate/apply to a practical framework.

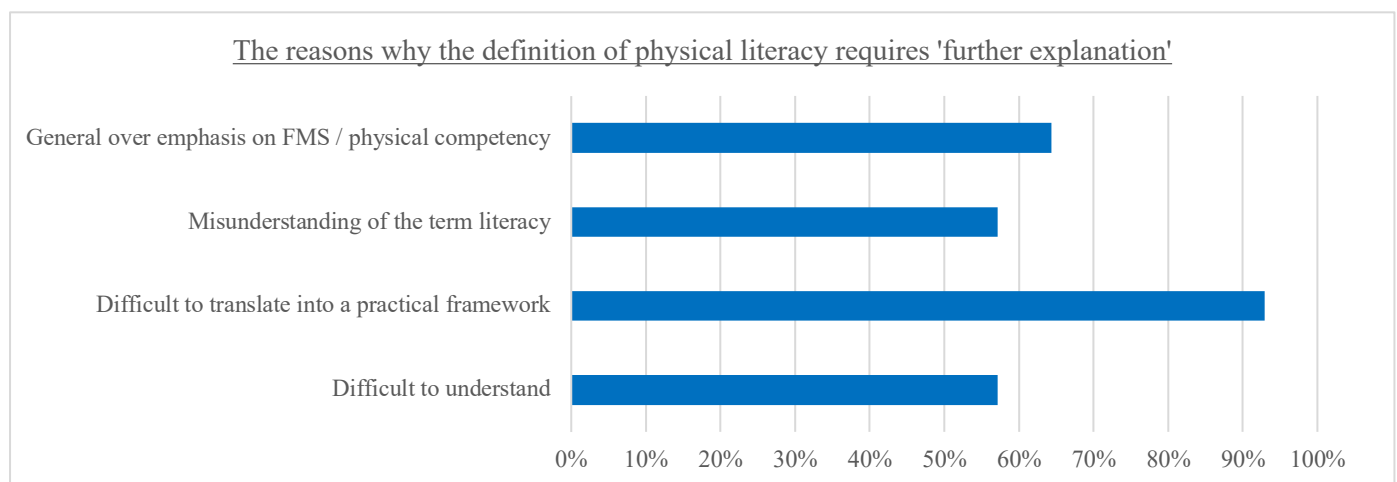


Figure 6: Result to question 2.1 (Round 2). N. B. This question was made available to 14 Respondents.

One panellist (6.67%) out of 15, indicated that physical literacy does not require further explanation. Their reasoning is summarised as “the goal is clearly set out as participation throughout life; the means to achieve this goal are set out clearly (e.g. motivation, confidence, physical competence and knowledge and understanding). The definition does not need any philosophical knowledge and is mainly based on psycho-social principles” (Panellist 10). However, clarification received from the IPLA (2017) stated that the definition is effectively driven by its philosophical over-pinning, therefore it is argued that physical literacy does require an understanding of the overarching philosophy.

Due to a variety of responses recorded from question 1 in Round 1, Round 2 looked at gaining a convergence of opinion via a single answer matrix on the definition. The definitions that were presented to the panellists reflected the responses gained in Round 1, along with the pertinent definitions from the literature review – these included Whitehead (1990), Whitehead/IPLA (2010, 2016) and ASC (2016) definition. It is to note that from the 13 (81.25%) out of 16 responses that attributed words that aligned with the IPLA’s definition, only six (40%) out of 15 panellists selected this definition from the list (see figure 7); therefore, following Round 2 consensus was yet to be reached, as the percentage agreement was less than 75% at this stage.

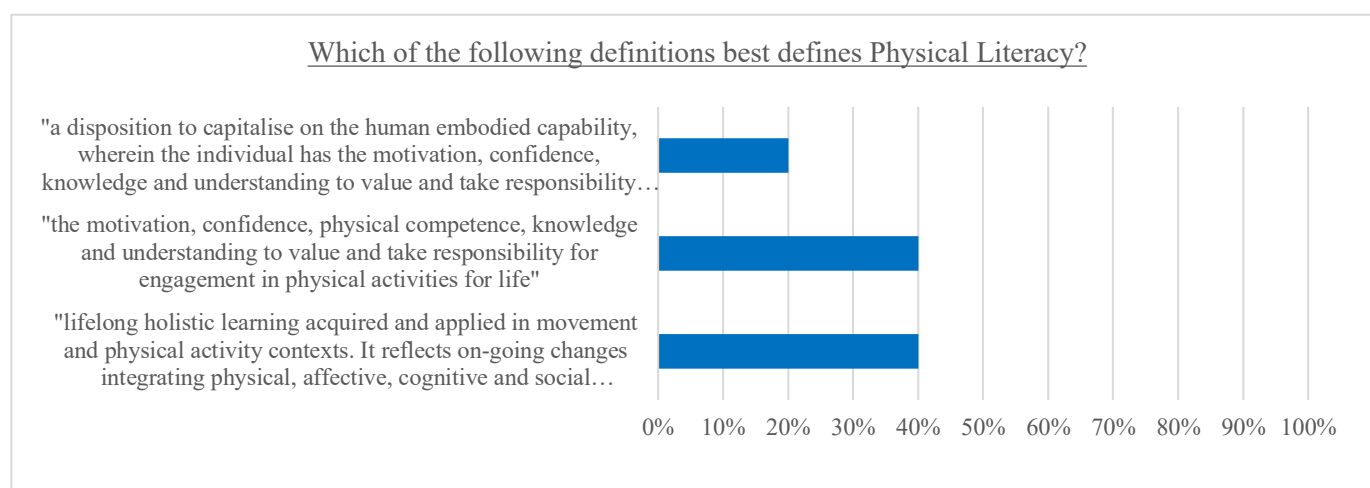


Figure 7: Result to question 1 (Round 2).

With a lack of consensus and the conflict in responses pertaining to the definition, it was relevant to track the individual responses pertaining to the definition between Rounds 1 and 2 (see Appendix 5.2.1 for this breakdown) and recirculate this data in Round 3.

In light of the contradictory selections – and given that 81.25% of panellists used words that align with IPLA’s definition – question 1 in Round 3 asked, *can you agree on IPLA’s definition to define Physical Literacy?* The response is articulated in figure 8.

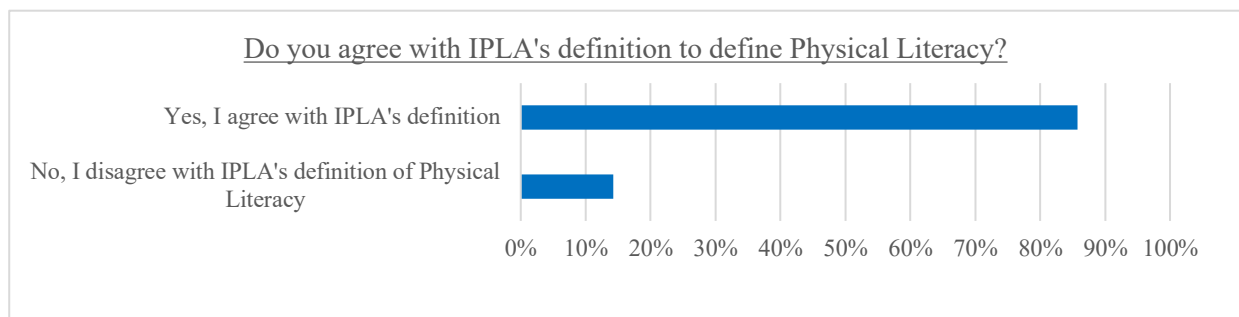


Figure 8: Result to question 1 (Round 3).

4.1.1 IPLA’s Definition

12 out of 14 panellists (85.71%) agreed on this definition following Round 3. Therefore, this thesis will take IPLA’s definition forward. IPLA’s definition is consistent and coherent with the Whiteheadian approach. The next step is to consider the underpinning domains.

4.2 Domains

In response to Mandigo *et al.*'s (2012) conceptualisation, the second aim of the study was to gain consensus on the domains that underpin the definition. Question 5 in Round 1 asked the panellists to respond to the domains that underpin IPLA's (2016) definition. In order to do so, they were presented with the following domains: affective; cognitive; cultural; physical; social; and spiritual. Their responses are formulated in figure 9. Please note that the panellists were able to select multiple answers.

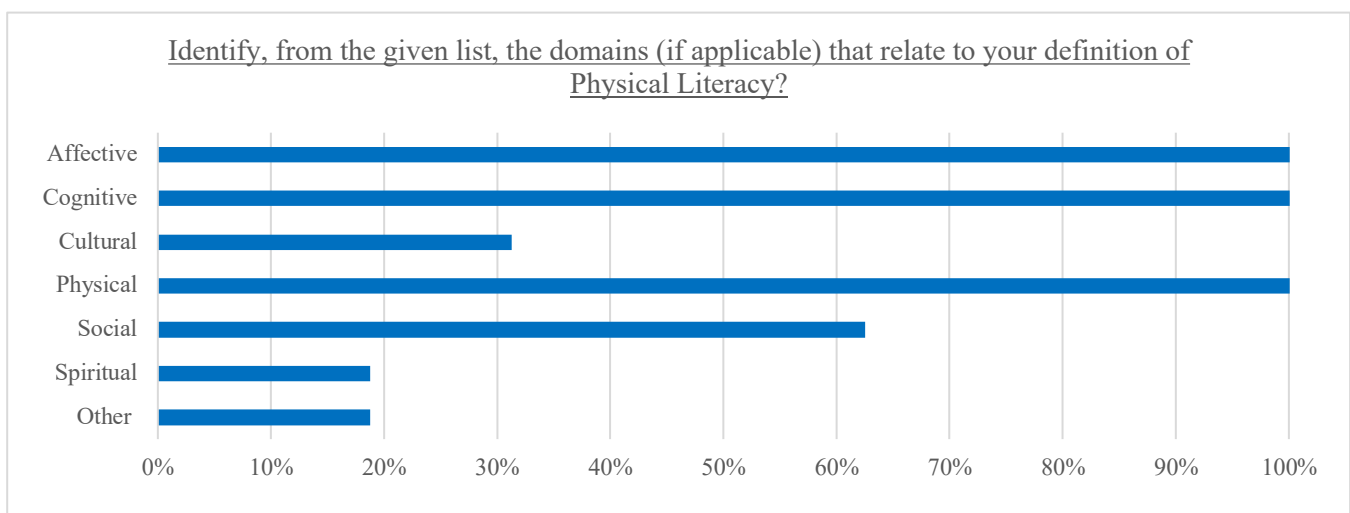


Figure 9: Result of question 5 (Round 1).

16 panellists (100%) selected affective, cognitive and physical. 10 panellists (62.5%) identified affective, cognitive, physical and social domains, whereas five panellists (31.5%) selected affective, cognitive and physical only. N.B one response (6.25%) was classed as an anomaly, as this panellist only clicked 'other'. For reference, this panellist suggested that perceptual and behavioural ought to be considered, as 'there has to be an engagement in physical activity' (Panellist 14). It is to note that this respondent declined to participate during Round 2 and asked to be removed from the panel.

With 62.5% of panellists selecting four learning domains, and only 31.5% selecting affective, cognitive and physical, it was considered that the social element would be taken forward to the next Round. In support, this domain is reflected in Mandigo *et al.*'s (2012) concept paper. The result from Round 3 is highlighted in figure 10.

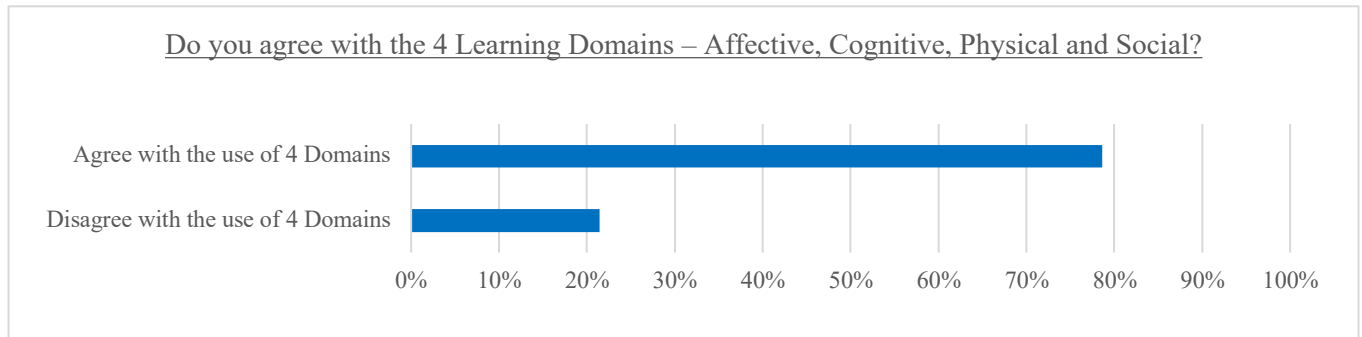


Figure 10: Result of question 3 (Round 3).

Two panellists (14.28%) of those that disagreed on the four domains expressed concern that physical literacy consists of three domains only. The reason provided, was that in order to be true to Whitehead's (2010) work the social domain does not exist. One panellist (7.14%) out of 14 indicated that spiritual ought to be added in order to reflect culture.

Given that 13 panellists (78.57%) agree on the four domains (affective, cognitive, physical and social) consensus has been reached. The next step is to consider the elements that underpin these domains.

4.3 Elements

The third aim of this Delphi was to gain consensus on the elements that underpin the domains, and in doing so, create a framework to underpin the definition. Question 4 in Round 2 asked the panellists, via open-ended questions, to list as many elements as possible that underpin the four identified domains. The more detail gained at this point, allowed for deeper analysis of the domains. This question was only made available to these respondents that indicated agreement

with the four domains. Figures 11, 12, 13 and 14 highlight the key responses, which begin to place elements under the relevant domains.

Due to the variety of responses recorded in response to question 4, Round 2. The elements recorded in Round 2 (Appendix 5.2.2) were presented to the panellists via a single answer matrix in Round 3. The results underpinning each domain are summarised below:

4.3.1 Affective

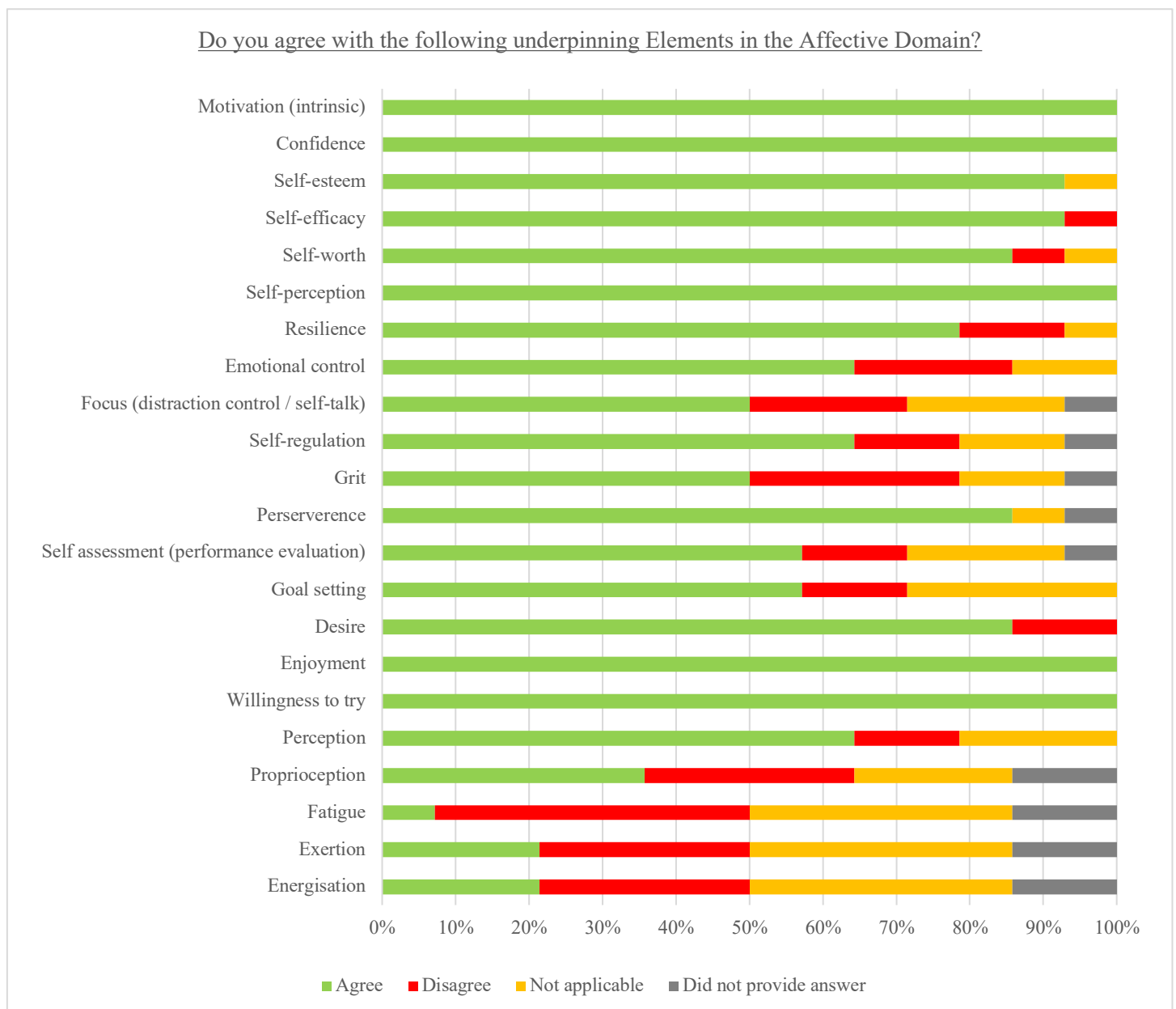


Figure 11: Result of question 4 (Round 3).

The data revealed a 100% agreement among panellists on motivation, confidence, self-perception, enjoyment, and willingness to try, whilst there was a $\geq 75\%$ agreement on self-esteem, self-efficacy, self-worth, resilience, perseverance, and desire. It is worth noting the comments that were presented from the panellists. First, “self-efficacy and self-worth are too similar with that of confidence and self-esteem” (Panellist 8). This was considered and recirculated in Round 3. As a result, confidence was taken forward. In addition, it was highlighted that the terms resilience and grit were too vague on their own (Panellist 8).

It was implied, by a number of panellists, that the following elements should to be reconsidered under the cognitive domain: focus; self-regulation; grit (although currently too vague on its own); perseverance; and goal setting (Panellists 3, 6, 8 and 12). One panellist noted that self-assessment is too similar to self-perception and desire is too close to motivation and/or subsumed in other elements already presented (Panellist 8); as a result, these comments were taken forward. On the contrary, Panellist 12 suggested that perception fits in the cognitive domain (and action-perception could also fit the physical domain). Furthermore, it was argued that proprioception, fatigue, exertion and energisation (i.e. what is sensed) better fits the physical domain (Panellists 8 and 12). These proposed changes were recirculated in Round 3. Following Round 3, judgement was reached on the following six affective elements:

Table 6: List of Affective Elements

Affective – relating to moods, values and attitudes (within a health setting).
<i>Confidence. Enjoyment. Motivation. Relatedness. Self-regulation. Willingness to Try.</i>

4.3.2 Cognitive

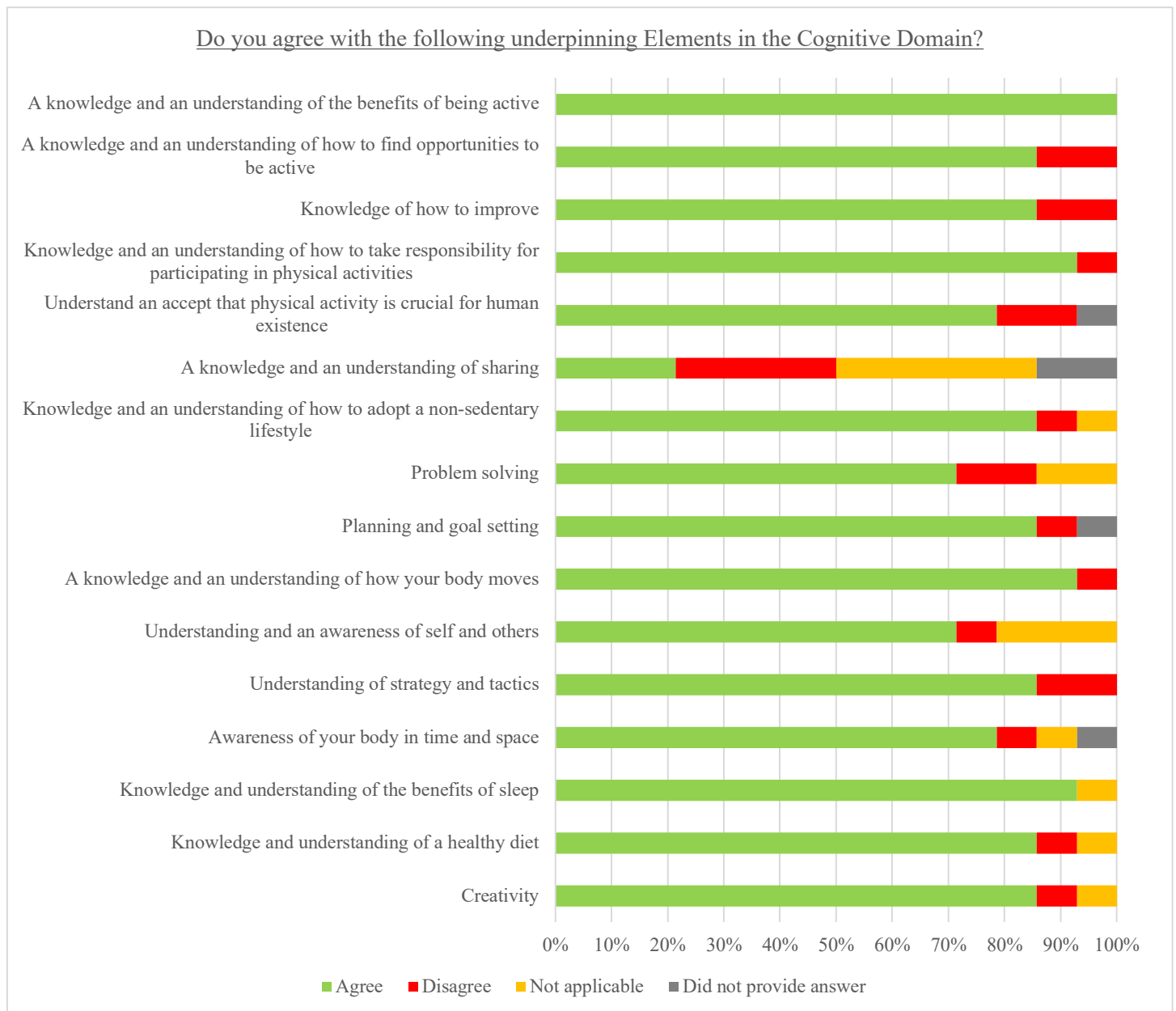


Figure 12: Result of question 4.1 (Round 3).

The data revealed a 100% agreement among panellists on the knowledge and an understanding of the benefits of being active, whilst there was a $\geq 75\%$ agreement on: a knowledge and an understanding of how to find opportunities to be active; knowledge of how to improve; knowledge and an understanding of how to take responsibility for engagement in physical activity; an understanding and acceptance that physical activity is crucial for human existence; knowledge and an understanding of how to adopt a non-sedentary lifestyle; problem solving;

planning and goal setting; a knowledge and understanding of how your body moves; understanding of strategy and tactics; awareness of your body in time and space; knowledge and understanding of the benefits of sleep; knowledge and understanding of a healthy diet; and creativity. The following comments were presented. Firstly, “knowledge and an understanding of how to take responsibility for participation in physical activity is worded awkwardly” (Panellist 8). Secondly, “a knowledge and an understanding of sharing is too vague, and spans into the social domain” (Panellist 8). Thirdly, “the knowledge and understanding of how to adopt a healthy active lifestyle is covered by a knowledge and an understanding of the benefits of being active” (Panellist 8). Fourthly, “an understanding and an awareness of self and others is too vague and could mean almost anything” (Panellist 8). “Understanding strategy and tactics equates to problem solving” (Panellist 8) and decision making, and, finally, “an awareness of body in time and space is the same as perception” (Panellist 8). As such, these could be clarified as content knowledge, decision-making, understanding and reasoning.

In addition, there was a suggestion (Panellist 6) to add the following two elements to the physical domain: knowledge and understanding of perceived physical competence; and knowledge and understanding of interacting with the physical environment, however as these two elements involved the process of acquiring knowledge these two suggestions were rejected. Instead, the element self-assessment was recirculated within the cognitive domain, as this process acquires an understanding through thought and experience. With the elements recirculated in Round 3, judgement was reached on the following 10 cognitive elements:

Table 7: List of Cognitive Elements

Cognitive – The process of acquiring knowledge and understanding through thought, experiences and the senses.
<i>Awareness. Communication. Content Knowledge. Creativity. Decision Making. Perseverance. Reaction-time. Safety & Risk. Self-assessment. Understanding & Reasoning.</i>

4.3.3 Physical

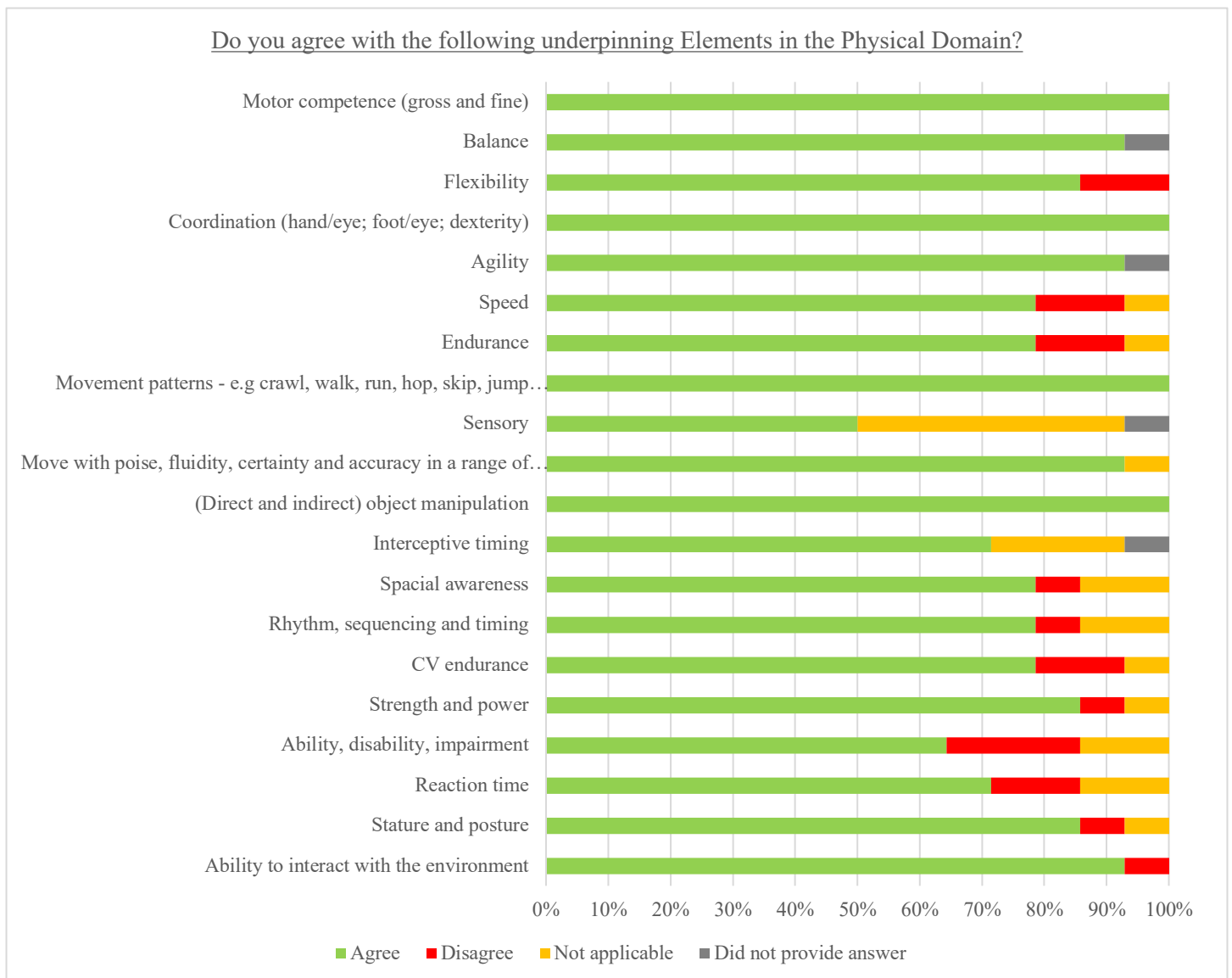


Figure 13: Result of question 4.2 (Round 3).

The data revealed a 100% agreement among panellists on: motor competence (gross and fine); coordination; movement patterns; and, object manipulation. Furthermore, $\geq 75\%$ agreement was achieved on balance; flexibility; agility; speed; endurance; move with poise; fluidity; certainty and accuracy in a range of physical environments; special awareness; rhythm, sequence/timing; CV endurance; strength and power; reaction time; stature and posture; and, ability to interact with the environment.

The comments from the panellists stated that sensory on its own requires more detail (Panellists 8 and 12). In addition, the proposition move with poise, fluidity, certainty and accuracy in a range of environments is too vague, as this combination spans many contexts and situations (Panellist 8). In addition, Panellist 8 suggested that interceptive timing is contained within the element object manipulation. Furthermore, it was argued that ‘sensory, interceptive timing, special awareness, rhythm/sequencing/timing, reaction time’ are all cognitive elements (Panellist 9).

To clarify, the element sensory relates to using different senses in order to interact within the physical environment. This element is considered vital and was, therefore, recirculated in Round 3. In addition, the element ability/disability/impairment indicates that all can participate in physical literacy regardless of their ability. With these elements recirculated in Round 3, judgement was reached on the following 13 physical elements:

Table 8: List of Physical Elements

Physical – Relating to motor control and fitness that a person acquires and applies through movement.
<i>Agility. Balance. Cardiovascular Endurance. Coordination. Flexibility. Movement. Movement Using Equipment. Muscular Endurance. Object Manipulation. Posture. Power. Speed. Strength.</i>

4.3.4 Social

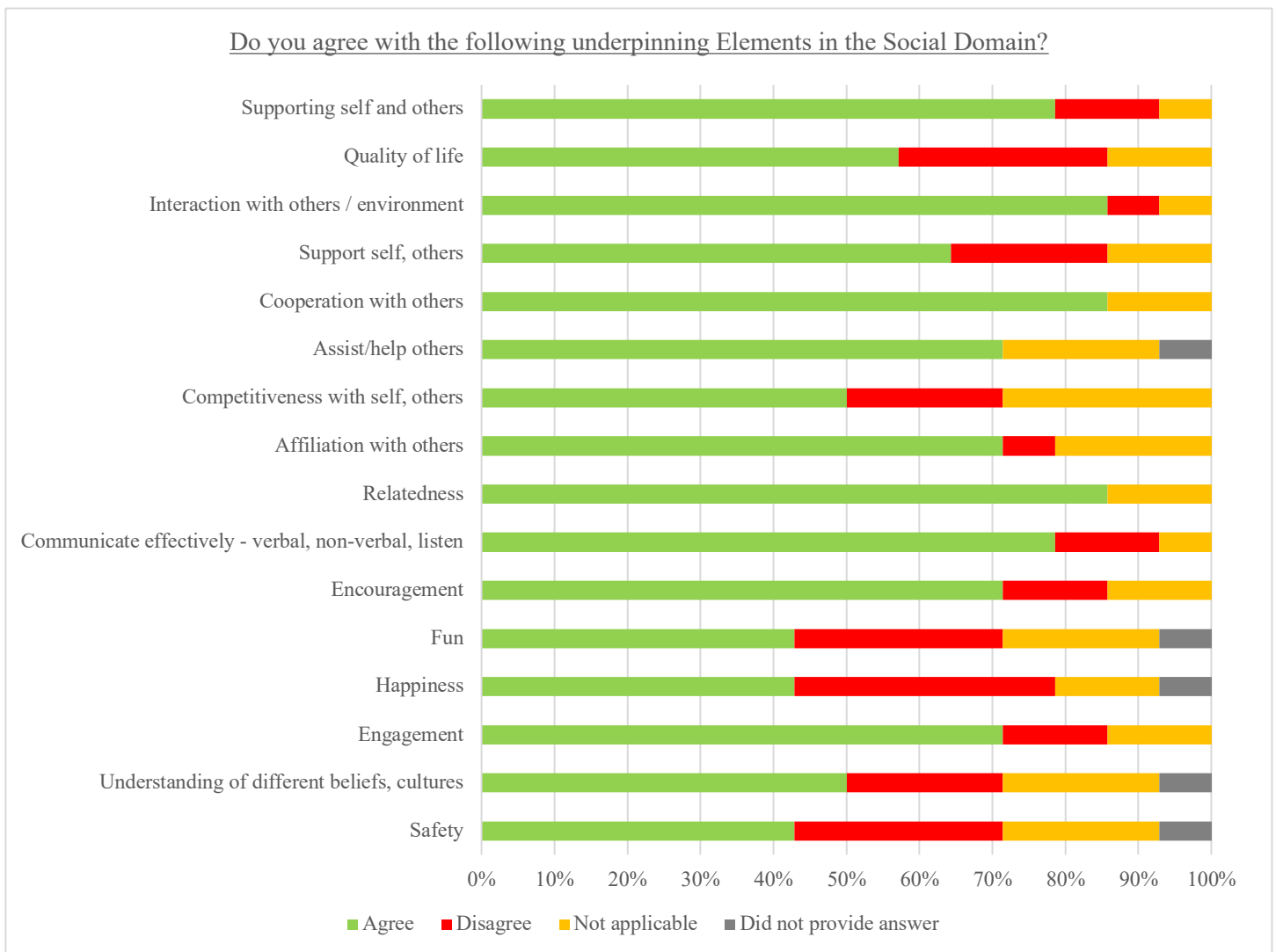


Figure 14: Result of Question 4.3 (Round 3).

There was $\geq 75\%$ agreement amongst panellists reached on: supporting self and others; interaction with others/environment; cooperation with others; relatedness; and communicate effectively. It was commented by a number of panellists that the wording supporting self and others is too vague; whilst quality of life, cooperation with others, competitiveness with self and others (not competitiveness per se, but ability to engage appropriately in competition), affiliation with others, relatedness, happiness, fun, engagement, and understanding of different beliefs, cultures could correspond to the affective domain. Furthermore, the elements communicate effectively and knowledge of safety relate to the cognitive domain.

In contrast, Panellist 10 firmly stated that “social domain does not feature in the IPLA definition.” Panellist 12 shared a similar view and suggests that “as these aspects will be displayed if motivated, these social elements sit better under the affective domain and not as a separate domain”. Nevertheless, with these elements recirculated in Round 3, judgement was reached on the following four physical elements:

Table 9: List of Social Elements

Social – Relating to society or organisation.
<i>Collaboration. Connectedness. Ethics. Society & Culture.</i>

Whilst the results achieved consensus on the definition, domains and elements, the Delphi obtained three by-products.

4.4 By-products of this Consensus Statement

In addition to gaining consensus on the domains and elements of physical literacy, the results obtained the following by-products. First, monism (i.e. *embodiment, phenomenology and existentialism*) overarch the definition. Second, physical literacy is both a process and an outcome, and third, that the concept should be measured. These by-products are expanded upon below.

4.4.1 Philosophy

In response to the literature review, and the epistemological note made (see pp. 44-45), it is apparent to consider how physical literacy maybe operationalised under different assumption sets to see if physical literacy could lend itself to other conceptualisations (Edwards *et al.*, 2016). These alternative epistemological considerations were addressed in question 4, Round 1.

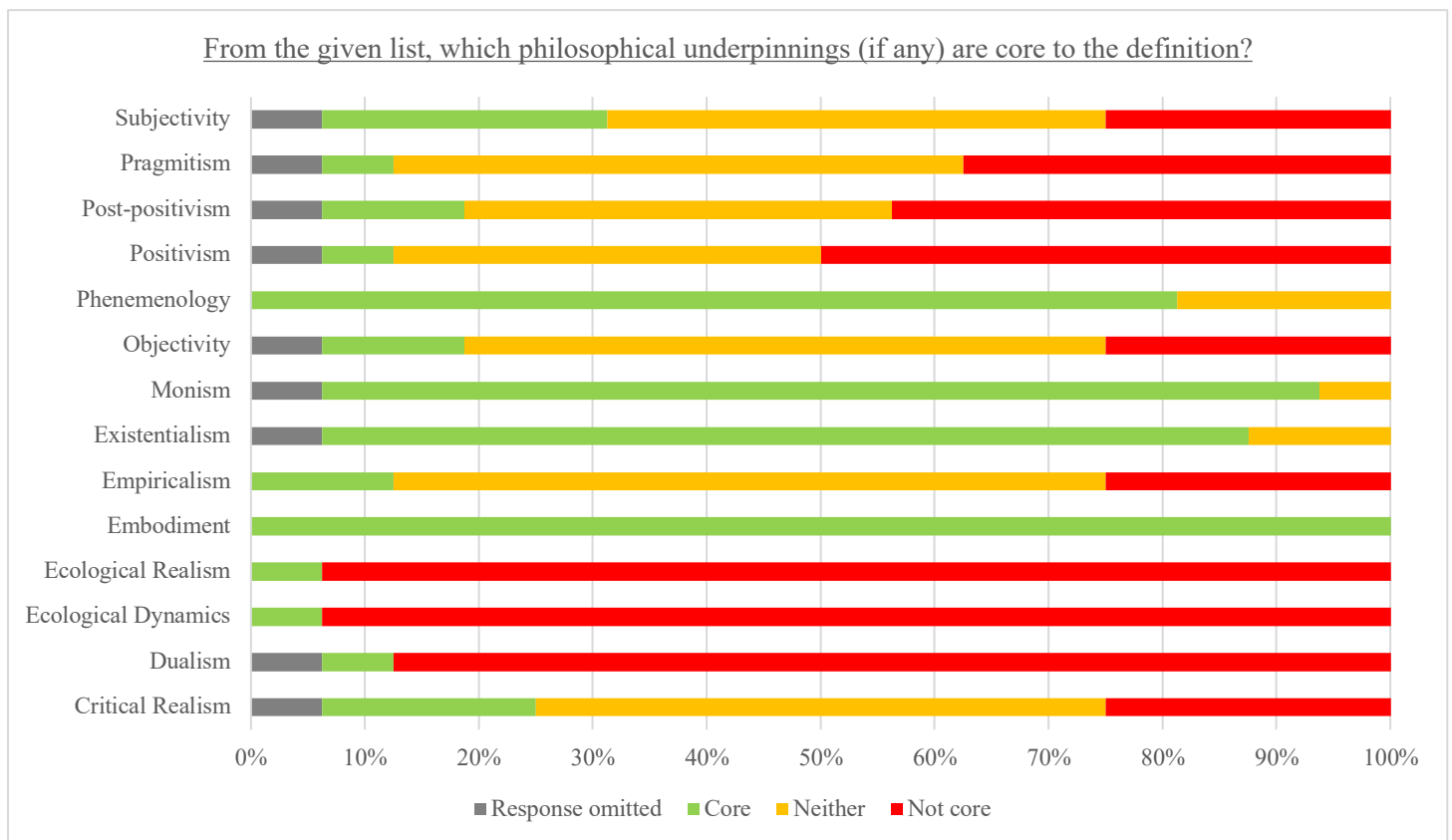


Figure 15: Result of question 4 (Round 1). N.B. Panellists could select multiple answers

From the result, 100% of panellists (16) implied that embodiment is core to the definition, whilst 13 panellists (81.25%) implied that existentialism and phenomenology are core. These results resonate with Edward *et al.*'s (2016) conclusion that embodiment, phenomenology and existentialism overarch the definition of physical literacy. Therefore, in terms of thinking, it is apparent that this result resonates with the Whiteheadian approach identified in the literature review.

4.4.2 A Process and an Outcome

In order to attend to the demand to make the concept practitioner-friendly, it is important to determine whether or not the concept is a process, an outcome, both or neither. The responses are recorded in figure 16.

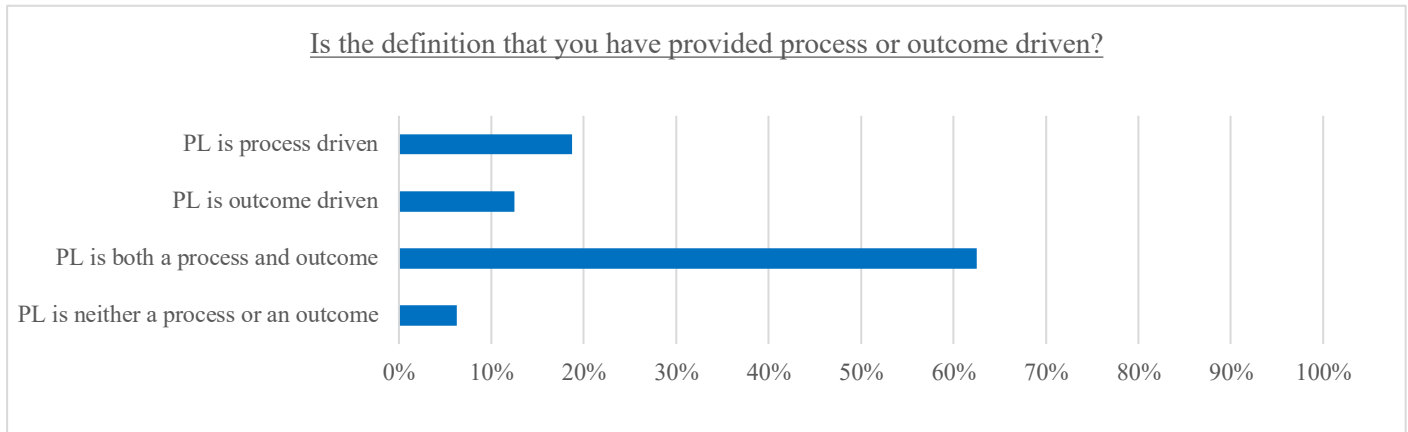


Figure 16: Result of question 1.3 (Round 1).

From reviewing the responses to this question, it was apparent that a number of panellists, when asked to provide reasoning to support their answer, contradicted their selection. For example, one response was interpreted as being process and outcome driven, rather than process driven, as their answer stated that “the same actions and outcomes can be achieved in different ways... i.e. by different processes” (Panellist 2). Therefore, their articulation implies that physical literacy is a process, and that it has an outcome. Additionally, two responses were interpreted as being process and outcome driven, rather than outcome driven, as one response indicated that “physical literacy, as a concept cannot really be taught, but it is an outcome of high quality physical education” (Panellist 7). In addition to providing an outcome, this answer indicates that physical literacy can be taught, therefore this is a process. The second response indicated that “physical literacy has a clear goal... the goal issues recommendations for practice” (Panellist 10). The connotations associated with the word practice, meant that this was interpreted as a process. On the other hand, the response that indicated that physical literacy is neither a process or an outcome, was interpreted as being a process as they gave the answer

“physical literacy is a journey throughout life where an individual develops their motivation, confidence competence, knowledge and understanding, or not... depending on their experiences that they are exposed too. The journey is unique to the individual and is not process driven but is created based on experience. The journey is not outcome based as there is no end goal” (Panellist 12). The fact that this answer highlights physical literacy being a journey, which is influenced by experience meant that that this was interpreted as being a process. With the following interpretations being made, figure 17 provides a representation to results obtained from question 1.3 (Round 1).

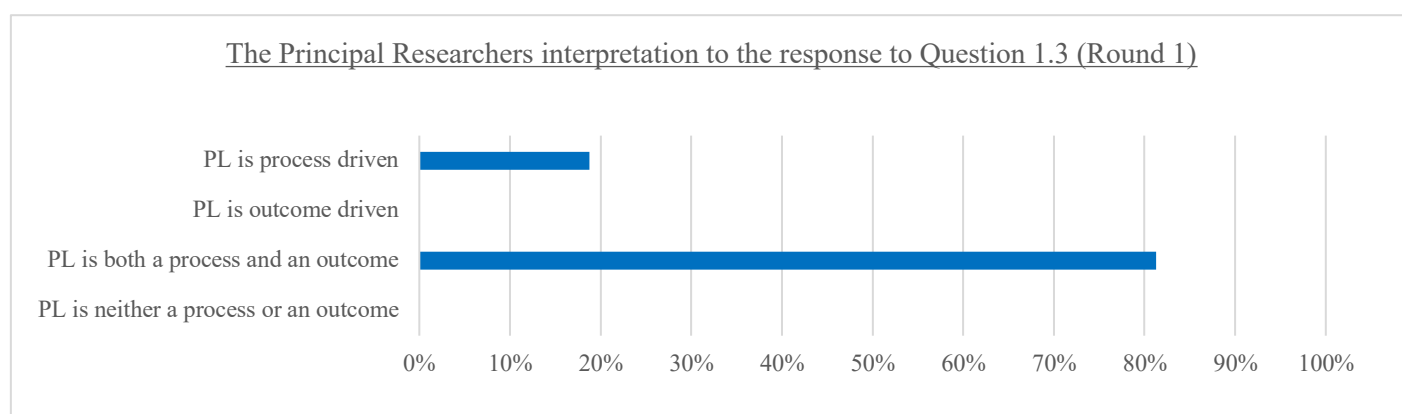


Figure 17: The result of the Principal Researchers Interpretation to Question 1.3 (Round 1).

Following this interpretation, 13 panellists (81.25%) out of 16 suggest that physical literacy is a process, that has an outcome. Table 10 highlights the reasoning behind the panellists' answers to question 1.3 (Round 1).

Table 10: Characteristics to Determine Whether Physical Literacy is a Process or Outcome

Process	Outcome
Journey	Being more motivated, competent and confident to participate
Evolving (process)	Enhanced opportunities for learning
Disposition (non-linear)	Influenced with how we interact with the environment

Innate qualities (i.e. engagement, value and responsibility)	Individual elements could be outcome driven (but depends on perception)
Motivation, confidence, physical competence, knowledge and understanding is the means to an end.	Engagement in physical activity for life. Outcome takes care of itself. Outcome focusses are there to provide credibility. Measurement is a necessary evil to gain acceptance, provide validity, convince stakeholders.
Holistic process	Endeavours to quantify and promote the use of physical literacy requires the ability to quantify PL as an outcome
Journey	Comprised of a plethora (or components that can be measured)
Journey that is changing and being shaped by our environments, our opportunities and our circumstance – that changes as life changes.	As our choices to engage in purposeful meaningful physical activity is the outcome of our sense of confidence

With regards to stimulating the measurement debate, question 5 (Round 2) asked the panellists *if physical literacy has an outcome?*

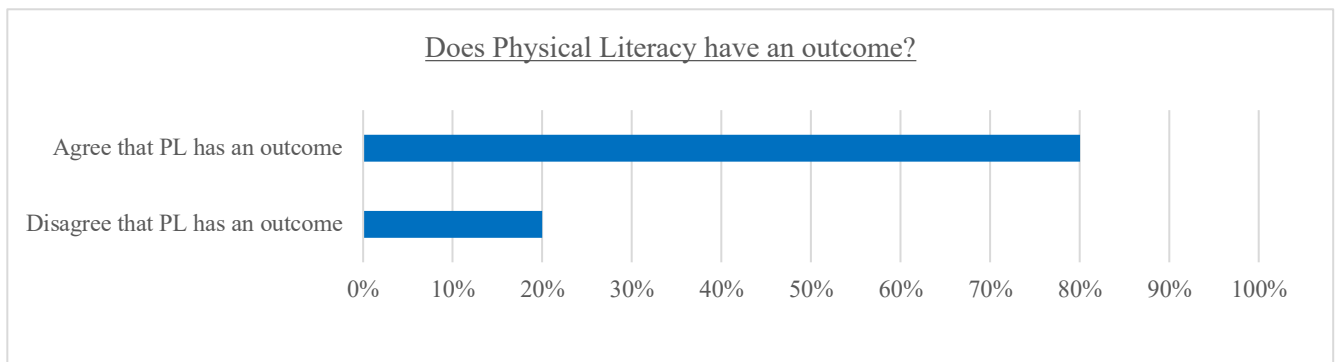


Figure 18: Result of question 5 (Round 2)

In response, Panellist 16 suggested that “physical literacy itself is neutral (i.e. someone could have a positive or negative state), either of these [states] have a consequence (outcome) based on context.” Moreover, 66% of those that agreed to physical literacy as an outcome indicated that this outcome related to lifelong engagement in physical activity. In light of another response, “physical literacy is a process, which facilitates the individual in finding

different outcomes which are individualised for different people, depending on their needs and interests and values. In this sense, physical literacy has a number of outcomes” (Panellist 2).

Whilst Panellist 1 indicated that “there is no end point in the physical literacy journey. Instead it is in a constant state of flux. It’s a lifelong commitment that ebbs and flows.”

These comments were considered and recirculated in question 2 (Round 3). Consensus was reached on the following, as 13 (92.86%) out of 14 panellists agreed that physical literacy is a process, and that it has an outcome, as reported in the Table 11.

Table 11: The Underpinning Consensus that Physical Literacy is Both a Process and Outcome

Process	Outcome
Creating an environment and opportunity whereby motivation, confidence, physical competence, knowledge and understanding can be developed and nurtured.	More confident, motivated, skilled and knowledgeable individuals who value physical activity and choose to participate for life.

4.4.3 Measurement

With agreement reached that physical literacy is a process that has an outcome, the question of measuring/charting progress can resume. This is pertinent if the concept is going to align with educational policy. Figure 19 portrays the results obtained from question 6 (Round 2).

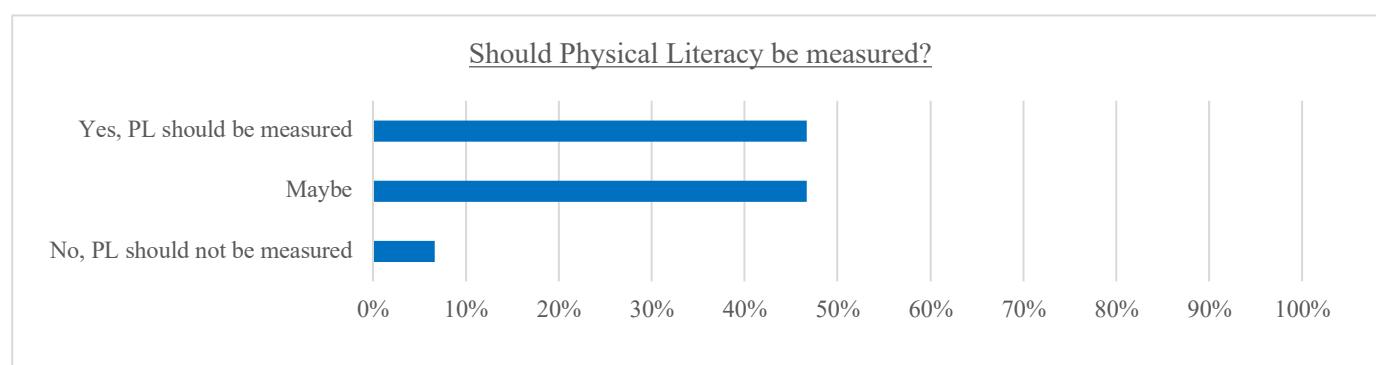


Figure 19: Result of question 6 (Round 2).

14 (93.33%) out of 15 panellists indicated that physical literacy should/should maybe be measured. Seven panellists indicated that this would allow progress/journey to be tracked.

Three high-order themes support the indication that physical literacy should be measured (N.B. this question was made available to seven respondents – those that selected *yes, it should be measured*). First, as identified by four panellists, this would allow progress/the physical literacy journey to be tracked. Second, as identified by seven panellists, alluded to the notion that this would support the concept of physical literacy in terms of research, policy and practice. Third, as identified by two panellists, that physical literacy should be measured as this would influence policy makers, in regard to the benefits of acknowledging and supporting the physical literacy concept.

In comparison, regarding the reasoning as to why physical literacy should maybe be measured (N.B. this question was made available to seven respondents), five panellists indicated that this would provide evidence towards the impact of a more holistic approach to physical activity/interventions and evaluate the provision of physical education. In addition, four panellists indicated physical literacy should be measured to track progress/journey, whilst three panellists indicated that this will assist policy makers, due to the fact that we live in an evidenced based society.

On the contrary, one respondent indicated that physical literacy should not be measured. The reason provided reads, “physical literacy is a disposition and therefore an abstract concept. Dispositions are exceptionally difficult to measure accurately because they are abstract – physical literacy is individual to that being and to the context that they are in” (Panellist 5).

With the majority of responses supporting the notion that physical literacy should be measured, question 5 (Round 3) asked the panellists: how would you measure, evaluate, assess, observe, chart or track a concept that is non-linear, complex and deeply integrated, which is beyond most common techniques? The results are highlighted in figure 20.

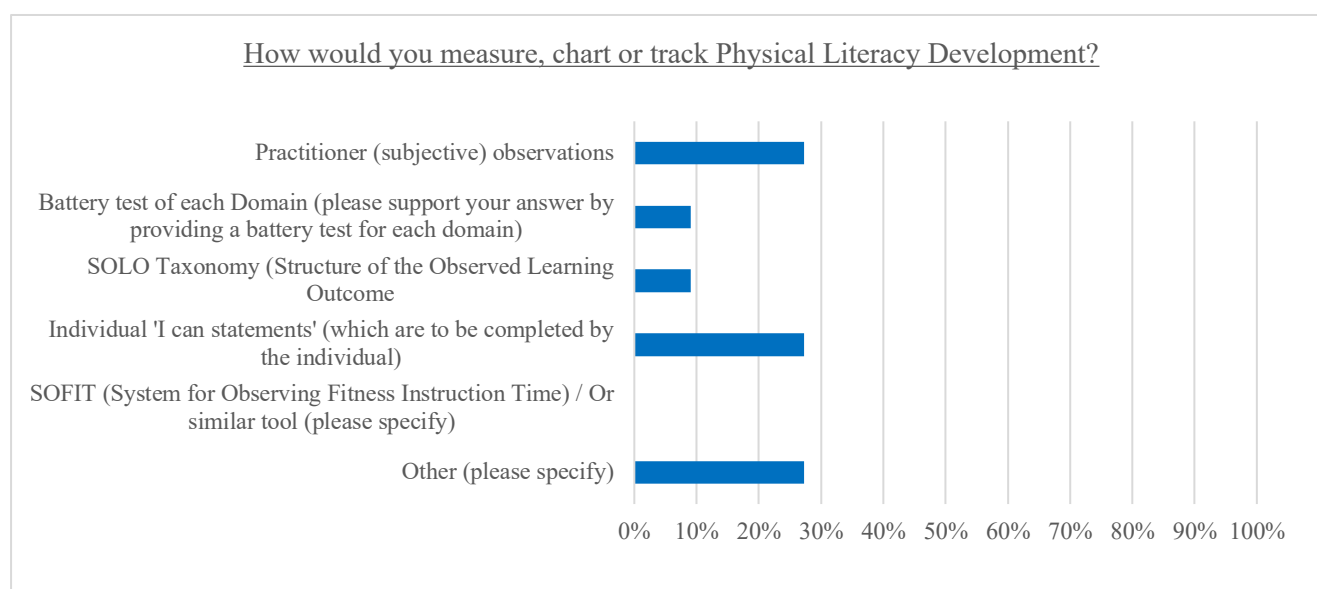


Figure 20: Result of question 5 (Round 3).

The results show that no clear method gained consensus. However, the following comments were obtained: “as physical literacy is an individual capability, tracking progress needs to be valued and owned by the individual – not a testing regime that assumes a ‘norm’ to be referenced off in all domains” (Panellist 3). Panellist 8 indicates that “broad guidelines to inform the purpose, how people assess and interpret assessment, either for themselves or others, depending on context is vital”. Panellist 6 implies that “all validated measures/assessments should be coupled with practitioner observations – individual ‘I can statements’ are also a method of understanding pupils’ perceived physical competence, although this cannot be the sole measure”, whilst, Panellist 7 suggests to “consider developing an assessment tool that is not a traditional method.”

4.5 Summary of Results

The Delphi obtained the following results, which are summarised below:

Overarching Philosophy
<i>Embodiment, Existentialism and Phenomenology.</i>

Definition of Physical Literacy
<i>Physical literacy is defined as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life.</i>

Process	Outcome
<i>Creating an environment and opportunity whereby motivation, confidence, physical competence, knowledge and understanding in physical activity can be developed and nurtured.</i>	<i>More confident, motivated, skilled and knowledgeable individuals who value physical activity and choose to participate for life.</i>

Domains
<i>Affective, Cognitive, Physical and Social (in alphabetical order)</i>

Underpinning Elements (in alphabetical order)	
<i>Affective</i>	<i>Confidence, Enjoyment, Motivation, Relatedness, Self-regulation, Willingness to Try.</i>
<i>Cognitive</i>	<i>Awareness, Communication, Content Knowledge, Creativity, Decision Making, Perseverance, Reaction-time, Safety & Risk, Self-assessment, Understanding & Reasoning.</i>
<i>Physical</i>	<i>Agility, Balance, Cardiovascular Endurance, Coordination, Flexibility, Movement, Movement Using Equipment, Muscular Endurance, Object Manipulation, Posture, Power, Speed, Strength.</i>
<i>Social</i>	<i>Collaboration, Connectedness, Ethics, Society & Culture.</i>

5.0 Discussion

This chapter formulates the central discussion around the value that the results from this study add to the conceptualisation of physical literacy. This discussion is split into three parts. The first part discusses the philosophical impact on the definition. The second discusses the essence of a *domain-element* framework to re-conceptualise physical literacy, whilst the third part discusses the practical implementation of this framework.

5.1 Philosophical Impact on the Definition

Whilst it is evident that physical literacy emerged from existentialist and phenomenological debates in the early 1990's (Whitehead, 1990), the results obtained from this Delphi study confirm the conclusion made by Edwards *et al.* (2016) that a monist philosophy overarches the concept. With this philosophical approach at the forefront of the discussion, and the domain-element framework present, this thesis is in a position to comment upon the recommendation made by Edwards *et al.* (2016), in that it is a requirement for academics and practitioners to either resolve or embrace the diverse approaches when conceptualising physical literacy. It was noted by Edwards *et al.* to tolerate these approaches until further research in the field had been conducted.

Following the results from this research study, academics and practitioners are now in the position to resolve the differences in approach when defining the concept. A monist approach indicates that the elements underpinning physical literacy are developed holistically (IPLA, 2014; Jurbala, 2015), this means for example that elements from the physical domain can entwine with elements from the affective, cognitive and social domains simultaneously (Mandigo *et al.*, 2012; IPLA, 2014; Keegan *et al.*, 2016). On the contrary, if a dualistic approach were to define physical literacy then the underpinning elements would be developed in isolation; in this case, the latter approach recognises fundamental movement skills as de-

contextualised and abstract notions. Therefore, with this ontology, these skills are detached from where the movement is occurring, who is doing the movement, their experience of this movement, and the consequence of this movement; hence, this approach aligns the dualistic ideology of developing the body as a machine (Descartes, 1984; Whitehead, 2010). Nevertheless, if these skills are developed in an applied setting, where the locomotive, stability and manipulative strands of fundamental movement are coupled with perception and action (Vickers, 2009; Davids, 2010) then this is one method, alongside others, to help develop the physical domain that underpins physical literacy.

It is therefore understood that in the attempt of aligning physical literacy to a dualistic landscape it has caused educational organisations, such as PISE (2016) and the YST (2013), to reduce the concept to its most simplest form. This has led to practitioners focusing on the physical domain, and consequently implementing fundamental movement skills in isolation to achieve development (DfE, 2013). Therefore, taking this discussion forward, the results in this study identify that philosophy drives the concept. Consequently, this thesis resolves the ideology of their being two approaches, as monism defines the Whiteheadian approach and dualism overarches the LTAD approach.

On the results of the consensus reached, and with the philosophical debate discussed, this thesis expands upon the limitation of Edwards *et al.*'s (2016) systematic review and provides an answer to the question of which philosophy and definition is correct. Consequently, this thesis refuses the Long-Term Athlete Development model as an approach to conceptualise physical literacy. This judgement is made on the rationale that it fails to respond to the embodied, existentialist and phenomenological nature of the concept; therefore, defying the consensus statement (Appendix 6). Moreover, as Edwards *et al.*'s (2016) systematic review did not curtail any other approach to conceptualise physical literacy, this thesis accepts the Whiteheadian approach moving forward. In doing so, it acknowledges IPLA's definition.

Consequently, this thesis refuses the definitions put forward by PISE (2016), SHAPE America (2016) and PHE Canada (2016) as these are connotations of the LTAD model.

With IPLA's definition repositioned at the forefront, the next chapter will discuss the addition of the *domain-element* framework to conceptualise physical literacy.

5.2 A Re-conceptualised *Domain-Element* Framework

The *domain-element* framework responds to the conceptual development presented by Mandigo *et al.* (2012). To expand, this development announced that the definition (originally conceptualised by Whitehead, 2010) informed the domains of physical literacy. In regard to a practical understanding, Keegan *et al.* (2016) indicated that the domains are underpinned by a number of elements. However, prior to this study, it was unclear of what the underpinning elements were (Francis *et al.*, 2016). Figure 21, outlines the conceptual development of physical literacy prior to the results of the Delphi.

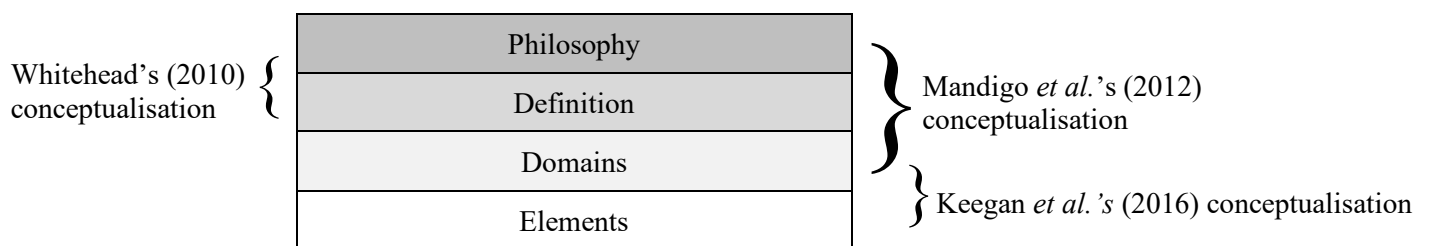


Figure 21: Re-conceptualised overview of physical literacy.

In order to respond to the call to make the concept practitioner-friendly (Keegan *et al.*, 2016), the results obtained realign the overarching philosophy with its definition and presents consensus on the domains and underpinning elements (Appendix 6). This development advances, and in-doing so adds value to, the original work espoused by Whitehead (2010), Mandigo *et al.* (2012) and Keegan *et al.* (2016) as practitioners are now in a position to realign the concept to their practice. Furthermore, academics can begin to reformulate the debate of

charting development in order to align the concept to the educational and health fields. However, before the practicality of implementing this re-conceptualised framework is discussed, the next chapter will outline the emergence of each element from the data analysis process, and critically evaluate the extent to which these findings build upon or contradict the literature review.

5.2.1 Discussion on the Emergence of the Element's

(N.B. these are presented in alphabetical order)

5.2.1.1 Affective

The affective domain relates to moods, values and attitudes associated within a health setting; as outlined in figure 1, this health setting is underpinned by exercise, sleep and nutrition (Whitehead, 2010). This domain is made up from the following elements:

5.2.1.1.1 Confidence

This element aligns with Edwards *et al.*'s (2016) systematic review, as 52% of the papers made reference to this core-category. Moreover, it explicitly appeared in 69% of the definitions that were analysed in Appendix 1. Defined as a feeling of self-assurance arising from an appreciation of one's own capabilities, this element conceptualises physical literacy as individuals that have low confidence (i.e. expectations of success) are more likely to have lower incentives to engage in exercise (Edwards *et al.*, 2016). However, this element also responds to the perceived return-on investment (as opposed to the notion of successful outcome). For example, this element allows an individual to present the attitude *I will get something out of this* as opposed to *I will succeed at this* (Keegan *et al.*, 2016); therefore, confidence is expressed as the overall pleasure/displeasure, enjoyment, and feeling expected from enacting in activity

or from reflection on past activity (Nasuti and Rhodes, 2013). This nuanced consideration allows this element to respond to the affective experiences, as well as the cognitive beliefs.

It is to note, that in this context, self-efficacy refers to the ability to complete the task/gain a desired outcome, or belief that one could overcome barriers to achieve a certain task; therefore, this construct, alongside self-esteem and self-worth are all subsumed within this element. As such, an increase in confidence facilitates interaction with a wider range of environments (Whitehead, 2010; Sport Wales, 2015; SHAPE America, 2016; PHE Canada, 2016).

5.2.1.1.2 Motivation

Defined as the value for engaging in exercise, sleep and nutrition in response to internal or external factors. This element appeared in 46% of the papers systematically reviewed by Edwards *et al.* (2016); furthermore it is prevalent in 50% of the definitions analysed in Appendix 1. When these sources were analysed, the majority adopted the intrinsic-extrinsic continuum of motivational regulation, offered by Deci and Ryan's Self Determination Theory (Deci and Ryan, 2008). In this context, motivation is invariably most optimal (and sustained over time) when individuals perceive inherent value, and gain intrinsic rewards, such as enjoyment from a task with no need for external incentive (Deci and Ryan, 2008). Furthermore, these sources recommend that tasks and situations should seek to develop intrinsic motivation by supporting the core psychological needs specified in Self Determination Theory; this theory implies the need for: competence (to experience progression and success on a task); relatedness (the need to feel both affiliation and belonging); and autonomy (the need to experience choice and a sense-of-control). Using the Self Determination framework, motivation refers to the *why* behind the behaviour/decision made or to the reasons behind an absence of behaviour (Deci and Ryan, 2008). It therefore reflects: a) what individuals choose to do; b) enjoyment; c)

persistence against difficulty; and d) seeking challenge and development (Keegan *et al.*, 2016). Keegan *et al.* (2016) describe motivation as a dynamic and evolving experience, for example being determined both prior to engagement in a task, during the task, and following the task due to experiences within it.

It is to note that although enjoyment and relatedness received support in the Delphi, it is on this grounding (Deci and Ryan, 2008; Keegan *et al.*, 2016) that enjoyment and relatedness are subsumed within the motivation element. Furthermore, whilst existing definitions involve the word motivation, it is noted that there are a range of highly related constructs in psychology research – including energisation, mood and emotion; alongside desire, determination, drive and passion (Phillippe *et al.*, 2004) – that have been defined, conceptualised and measured separately by different research groups. Similarly, in education there are a number of closely related ideas, which include growth (versus fixed) mindsets (Dweck, 1986), resilience, (Fletcher and Sarkar, 2013; Kinman and Grant, 2011), and grit (Hochanadel and Finamore, 2015). It is important to acknowledge relevant concepts when proposing a new revised framework, therefore these constructs were represented in the Delphi. However, the results found that resilience and grit are too vague on their own, as such, these are also subsumed within the motivation element.

Under this conceptualisation, motivation is constructed as an affective element; however, to align with the physical literacy concept, it is important to recognise that this element entwines with the cognitive, physical and social domains too.

Note: Enjoyment, Relatedness and Willingness to Try

First, it is to note that the notion of enjoyment received support in the Delphi alongside the literature, as 26% of the papers systematically reviewed by Edwards *et al.* (2016) referenced to this core-category; however, Go2Play (2016) imply that (fun is the motivating factor for

children, therefore) physical literacy is developed through varied and enjoyable scenarios. Therefore, it is on this grounding that enjoyment is subsumed within motivation. As such, individuals who are enjoying themselves are more likely to be motivated, focused and engaged on the task at hand and therefore more resistant to distraction(s). Second, in proposition of relatedness, it is on the grounding that this is consumed within Self Determination (Deci and Ryan, 2008) that this construct is subsumed within motivation.

Third, the construct willingness to try gained traction in the Delphi results; however, as this construct is defined as the attitude of being prepared to engage in exercise, sleep or nutrition in order to perceive a benefit, it is too closely connected with motivation, as for example the more (confident and) motivated an individual is, then the more willing they will be to try something new. Consequently, this construct is also subsumed within motivation.

5.2.1.1.3 Self-regulation

Defined as a capacity to control emotions, proprioceptive signals and resulting behaviours in relation to different scenarios. This element, allows a physically literate individual to channel frustration into motivation. Furthermore, physically literate individuals have the capacity to overcome nervousness and have the aptness to control fatigue (Keegan *et al.*, 2016).

Under this conceptualisation, self-regulation is constructed as an affective element; however, to align with the physical literacy concept, it is important to recognise that this element entwines the cognitive, physical and social domains too.

To summarise – although the constructs enjoyment, relatedness and willingness to try were included in the summary of results, these have been subsumed within motivation, therefore following this discussion – the affective domain is constructed from three elements. As such, this domain recognises that a physically literacy individual has the capacity to: a) identify and

draw confidence, motivation and enjoyment from different experiences; b) manage emotional response such as empathy and sensitivity in different situations; and c) manage physiological responses such as fatigue or pain.

5.2.1.2 Cognitive

The cognitive domain relates to the process of acquiring knowledge and understanding of exercise, sleep and nutrition through thought, experience and the senses, as a means to develop health. It encompasses an individual's understanding of how, when and why to respond in particular ways, and how to adapt and be innovative when faced with new challenges. From the results, this domain is made up of the following elements:

5.2.1.2.1 Awareness

Defined as the understanding of an environment based upon experience, insight, intuition, observation and internalised information, this element responds to the perception of oneself (or an object) in time and space. To conceptualise this, a physically literate individual has the capacity to negotiate around, through, over or under objects. Furthermore, they have the capacity to recognise where others or objects are located in time and space. Finally, they have the capacity to recognise changes in environmental conditions, and can adjust their solution(s) accordingly. By having this awareness, physically literate individuals can conceptualise self-perception, self-awareness, rhythm and timing; therefore these constructs are subsumed within this element.

5.2.1.2.2 Communication

Defined as the imparting or exchanging of information by speaking, writing or using other means such as sign language or signals. This element allows individuals to engage with others;

therefore, the more lingual (or multi-lingual) an individual is, then the greater capacity they have to engage with others. Under this conceptualisation, communication is constructed as a cognitive element; however, to align with the physical literacy concept, it is important to recognise that this element entwines the physical and social domains too.

5.2.1.2.3 Content Knowledge

Defined as factual information that an individual understands and can convey; this is important for recognition, recall and planning in different settings (Renshaw *et al.*, 2010). To conceptualise this element, a physically literate individual recognises, recalls and plans effective ways to be active, sleep and eat; alongside ways to improve (Keegan *et al.*, 2016). Furthermore, a physical literate individual has the capacity to recognise and respond to rules and regulations that govern society.

5.2.1.2.4 Creativity

Defined as the use of imagination or original ideas to solve a task, a physically literate individual has the capacity to think on their feet. To conceptualise this, Boing Kids (2014) indicate that a physically literate child is a confident and creative child.

5.2.1.2.5 Decision Making

This element relates to devising strategy and tactics, for example how the end (goals) will be achieved by the means (resources). This domain includes the capacity to problem-solve (which is understood as the process of finding a solution), plan and goal-set. As such, these constructs are subsumed within this element. To conceptualise this, a physically literate individual has the capacity to devise an action plan to motivate and guide them towards a goal. Moreover, this element enables individuals to make informed choices that are beneficial to themselves, others

or the environment (PHE Canada, 2016). Hence, although this element is constructed as a cognitive element, it entwines with elements across the domains.

5.2.1.2.6 Reaction-time

Defined as the length of time taken to respond to a given stimulus. This element entwines awareness (i.e. perception), cognitive agility and decision making.

5.2.1.2.7 Safety and Risk

Defined as the understanding of risks, risk management and safety considerations for oneself and others. To conceptualise this, a physically literate individual behaves responsibly by not endangering themselves or others. Furthermore, they understand rules and regulations, and acknowledge potential risks before participating in an activity. Finally, an individual will have the understanding to stop if the risk was too adverse.

5.2.1.2.8 Self-assessment

Defined as the evaluation of oneself or one's actions, attitudes or performance. To conceptualise this, a physically literate individual has the cognition to recognise strengths and areas for development.

5.2.1.2.9 Understanding & Reasoning.

Defined as consciously making sense of situations, applying logic, establishing and verifying facts, and changing or justifying beliefs based upon new and existing information. To conceptualise, a physically literate individual will establish the understanding of the benefits of being active, sleeping and eating a balanced diet. Furthermore, these individuals will

understand their capability of their senses to interact with their surrounding environment. As such, this element is entwined with elements across the domains.

Note: Perseverance

Although this construct – defined as persistence in continuing despite difficulty or delay in achieving success – gained traction in the Delphi and was included in the summary of results, it is too closely connected with the conceptualisation of motivation. Consequently, this construct is subsumed within motivation in the affective domain.

To summarise – although perseverance was included in the summary of results, this has been subsumed within motivation, therefore following this discussion – the cognitive domain is constructed from nine elements. As such, this domain recognises that a physically literate individual has the capacity to: a) think, understand and make decisions, knowing how and when to act; b) understand, follow and anticipate rules; c) know personal strengths alongside areas for development, and ways to achieve successful outcomes; and d) know and understand the short and long term benefits of adopting a healthy lifestyle.

5.2.1.3 Physical

The physical domain relates to motor control and fitness that an individual acquires and applies through movement. It requires the coordination and fitness to perform the movements required in different situations – for example through the air, on land, in water, on snow or ice (Higgs, 2010) – in order to maintain a healthy lifestyle. This domain is made up from the following elements:

5.2.1.3.1 Agility

Defined as the capacity to quickly change direction, speed or body position, this element is conceptualised as a capacity to react or move. As such, this element captures cognitive agility and physical agility, therefore although constructed as a physical element, it entwines with the cognitive domain. In support, the Youth Sport Trust (2013) view physical literacy as the development of agility, balance and co-ordination.

5.2.1.3.2 Balance

Defined as the capacity for an individual to distribute their centre of mass over their base of support, allowing them to remain stable. To conceptualise, this element involves static balance, counter balance (i.e. balancing on a secondary object), balancing on uneven surfaces, balance while moving and maintaining balance while transferring weight (YST, 2013). Therefore, a physically literate individual will have the capacity to balance on land, on water (i.e. water-skiing), on snow (i.e. skiing) and on ice (i.e. ice-skating). Balance entwines with coordination and the cognitive element of understanding and reasoning.

5.2.1.3.3 Cardiovascular Endurance

Defined as the capacity of the heart and lungs to deliver oxygen to working muscles during exercise. This element is vital for an individual to engage in exercise for a sustained period of time. To conceptualise, a lower resting heart rate implies a more efficient heart function and therefore improved cardiovascular fitness (NHS, 2017). In response, an ideal resting heart rate for individuals aged: 3 to 4 years old is one that ranges between 80 to 120 beats per minute; 5 to 6 years old is one between 75 to 115 beats per minute; 7 to 9 years old is one between 70 and 110 beats per minute; whereas, individuals aged 10 and above is one between 60 to 100 beats per minute (BHF, 2014).

5.2.1.3.4 Coordination

Defined as the capacity to move two or more body parts at the same time in a controlled, smooth and efficient manner. This element is conceptualised as hand-eye coordination, foot-eye coordination and dexterity; furthermore, this capacity allows an individual to move.

The Delphi gained traction on the construct object manipulation; however, as this is defined as the use of hands, feet or another body part to move or manipulate an object, this is too closely connected with coordination. Furthermore, object manipulation requires coordination to strike, throw, dribble or catch for example, therefore – although the summary of results included this element – it is on this grounding that this is subsumed within the coordination element.

5.2.1.3.5 Flexibility

Defined as the capacity of a joint or muscle to move through or extend its full range of motion; this element, allows an individual to stretch, turn or twist. It is therefore applicable when walking or sitting for example. Furthermore, this element is entwined with coordination and movement.

5.2.1.3.6 Movement

Defined as the manipulation of skills that apply locomotion, coordination and stability to allow an individual to move from one spot to another (either through the air, in water, on land, snow or ice). To conceptualise this, this element includes fundamental movement skills, such as: rolling, sliding, climbing, running, skipping, galloping, dodging, leaping, jumping and hopping. In the context of water, this includes skills (such as gliding, diving and floating) that allow an individual to move or float safely in water.

It is to note, that this element conceptualises the subtheme physical capabilities that is presented in Edwards *et al.*'s (2016) systematic review. As such, the core-categories: movement capacities; motor skill competence; physical competence; fundamental movement skills; and purposeful physical pursuits are all subsumed within this element. Consequently, this element includes Whitehead's (2010) physical competence attribute. As a result, 88% of the definitions analysed in Appendix 1 allude to this element.

It is pertinent to revert back to the literature review, as Harman (2011) identified movement at the core of physical literacy; however, this element alone does not and cannot constitute a full definition (Whitehead, 2001) because 'physical literacy is a holistic engagement that encompasses physical capacities embedded in perception, experience, memory, anticipation and decision making' (Whitehead, 2001: p. 131). From this, if fundamental movement skills (e.g. agility, balance and coordination) are developed in an applied setting (Renshaw *et al.*, 2010; Chow *et al.*, 2016; Edwards *et al.*, 2016), where the locomotive, stability and manipulative strands are coupled with the effective, cognitive and social domains, then this method is applicable to develop the physical domain that underpins physical literacy.

5.2.1.3.7 Movement Using Equipment

Defined as the manipulation of skills that apply locomotion, coordination and stability to move from one sport to another (either through the air, in water, on land, snow or ice) using equipment. To conceptualise, this element involves driving a car, using a bicycle or skis for example to get from one place to another. As such, this element entwines coordination, balance and movement, alongside the cognitive elements: content knowledge, and understanding and reasoning.

5.2.1.3.8 Muscular Endurance

Defined as the capacity for muscle(s) to repeatedly exert force over a sustained period. To conceptualise this element, muscular endurance is used to pull and push, or walk for a period of time. As such, this entwines with cardiovascular endurance, movement and strength.

5.2.1.3.9 Posture

Defined as the position in which an individual holds their body when standing, sitting, or moving. This element corresponds to Edwards *et al.*'s (2016) core-category of 'movement with poise and economy' (p. 5). To conceptualise, a physically literate individual recognises the importance of an upright posture when sitting or walking in order to reduce the strain on their back. As such, failing to consume this element could result in back pain in later life.

5.2.1.3.10 Power

Defined as the capacity to exert maximum force (strength) as quickly as possible (speed). To conceptualise this, an individual uses this element to accelerate when running, jumping or throwing for example. As such, this entwines with coordination, strength and speed.

5.2.1.3.11 Speed

This element is defined as the capacity to move quickly across land, water, snow, ice or through the air; or to move limbs quickly. A physically literate individual conceptualises this element as the capacity to change speed (i.e. accelerate into a sprint) or moving their arm quickly through for a forehand shot; hence, this element entwines coordination, speed and cardiovascular endurance.

5.2.1.3.12 Strength

Defined as the maximal force applied against a load, a physically literate individual uses this element to pull and push. As such, this element is entwined with movement and coordination.

To summarise – although the construct object manipulation was included in the summary of results, this has been subsumed within coordination, therefore following the discussion – the physical domain is constructed from 12 elements. As such, this domain recognises that a physically literate individual has the capacity to: a) perform movement that involves controlling and adapting posture and balance, to successfully negotiate different situations and environments; b) apply movement strategies that a situation or environment requires; c) manipulate and control different objects using appropriate movement across a variety of environments; and d) build a level of fitness to successfully pursue a healthy lifestyle.

5.2.1.4 Social

The social domain relates to an individual's interaction with others and the environment in relation to leading a healthy life. This domain is made up from the following elements:

5.2.1.4.1 Collaboration

Defined as social skills for successful interaction with others to achieve outcomes in health scenarios. To conceptualise this, a physically literate individual has the capacity to engage in communication, resolve conflict, leadership, empathy and cooperation. Furthermore, a physically literate individual has the capacity to build rapport that allows an individual to interact effectively with others. They will be able to share and develop trust, show awareness of feelings, needs and the interests of others; hence this element is entwined with affective (awareness) and cognitive (communication, understanding and reasoning) elements.

5.2.1.4.2 Connectedness

Defined as an individual's appreciation for the environment and belonging to the community. To conceptualise this, a physically literate individual has the capacity to access the community to facilitate or enhance health. In addition, individuals use or adapt their environment for health purposes. As such, this element is entwined with understanding and reasoning.

5.2.1.4.3 Ethics

Defined as the moral principles that govern an individual's behaviour, relating to fairness, inclusion, equity, integrity and respect whilst participating in an active and healthy lifestyle. To conceptualise this element, a physically literate individual will express fairness and include others. Furthermore, they have an understanding of consent; hence, although this is constructed as a social element, it is closely entwined with affective, cognitive and physical elements.

5.2.1.4.4 Society and Culture

As highlighted by Roetert and Jeffries (2014), physical literacy is an international concept; as a result, Corbin (2016) suggests that because societies have different cultures, the way in which physical literacy is defined varies. On this grounding, the inclusion of this element is pertinent. Defined as an appreciation of the diversity, values, rights, responsibilities and constraints of individuals, cultures and societies, and their influence on participation; a physically literate individual has the capacity to value the contribution that diversity brings to their own, and others, health agenda. On this note, spirituality is subsumed within this element; which entwines with content knowledge, understanding and reasoning.

To summarise, the social domain is constructed from four elements. As such, this domain recognises that a physically literate individual has the capacity to: a) appreciate and utilise the

community and environment to connect a healthy lifestyle; b) lead others in collaborative, ethical and inclusive behaviours; c) develop a sense of openness, which includes sharing and learning from either your own or others experiences; and d) exhibit fairness and ethical behaviour in a variety of environments.

The addition of domains and elements to conceptualise physical literacy align to IPLA's clarification post (2014), in that these elements are entwined and are co-dependent; therefore physical literacy is the blend of these elements. As such, if one or more of the domains is lacking or lagging behind another, or individuals focus solely on one of the domains, then their capacity to be physically literate is affected (IPLA, 2014). Consequently, the domain-element framework moves away from Whitehead's (2010) rigid explanation of the characteristics that define a physically literate individual (see figure 3), as it recognises the different elements that are needed in order to overcome the scenarios presented in different environments, in everyday situations. Moreover, this framework indicates that a realignment and rethinking of attitudes has taken place. In this case, the perspective of our human nature has resulted in the creation of new discourse (i.e. physical literacy elements). It is worth noting that like the chemical Periodic Table, elements may emerge, dissolve or subsume over time.

The next chapter will discuss practically implementing this framework to develop physically literate individuals. The purpose of the chapter is to overcome the perceived complexity of conceptualising physical literacy to practice, which was made apparent in both the literature review (Kirk, 2005; Edwards *et al.*, 2016) and in the response to the early rounds of the Delphi.

5.3 Practically Implementing this Re-conceptualised Framework

On the premise that 92.86% of panellists indicated that physical literacy is difficult to translate/apply to practice (see figure 6), the consensus statement (Appendix 6) adds value when discussing the practicality of implementing physical literacy, as it recognises the concept as a process that has an outcome. This conceptualisation adds value to the definitions analysed in Appendix 1, as PISE (2016), SHAPE America (2016) and NSW DEC (2015) pertain to a desirable state, rather than acknowledging physical literacy as a process. However, on the other hand, it is to note that the clarification posts presented by IPLA (2014) and PHE Canada (2016) implicitly acknowledge physical literacy as a developmental process.

Taking this discussion forward, the consensus statement informs that physical literacy is a process, that has an outcome; therefore, it is the responsibility of practitioners working within the educational and health fields to create environments and opportunities whereby motivation, confidence, physical competence, knowledge and understanding in physical activity and health can be developed and nurtured. As, when achieved, this creates more confident, motivated, skilled and knowledgeable individuals who value physical activity and choose to participate for life (Appendix 6).

The subchapter below develops this discussion in the context of physical education as this was the most popular contextual core-category in which physical literacy is considered (Edwards *et al.*, 2016). To reiterate, this context is compulsory for children aged four to 16 in the United Kingdom (DfE, 2013); therefore, it is considered the main environment in which children are active (Jurbala, 2015).

5.3.1 In the Context of Physical Education

If physical literacy is to become the ‘the goal be reached’ (Whitehead, 2013a: p. 42) within physical education, it is vital that practitioners align their pedagogical approach with the

oncological pillars of the concept. As such, the literature review revealed a strong argument that prompts the reconsideration of both curriculum content (YST, 2014), as well as the methods of delivery (Keegan *et al.*, 2016) – in doing so, Edwards *et al.* (2016) implies that this constitutes a new self-contained pedagogical model of physical literacy.

To achieve this, this discussion promotes a constructivist approach by utilising problem-based learning (via a constraints-led approach) and play as the pedagogic tool to develop a child's physical literacy (Savery and Duffy, 1996; Moyles, 2005; Barab and Roth, 2006; Lester and Russell, 2008). A problem-based approach shifts the focus of physical education away from abstract notions of sporting proficiency and towards holistic development, as it allows children the opportunity to move freely guided by natural instinct (Kental and Dobson, 2007). Therefore, setting a contextual problem to solve during a Key Stage 1 or 2 physical education lesson allows children to explore different ways of moving. This in turn requires motivation to move, and develops confidence in their ability to execute these movements. As such, this pedagogic approach fosters the domains that underpin the concept; furthermore, instilling motivation and confidence to move during these early stages of life will help children to enjoy movement, which in turn will inspire ongoing participation in exercise throughout life.

It is to note that it is vital for practitioners to construct learning environments that are within the zone of proximal development (Vygotsky, 1978), as if a child cannot access the problem it could result in a decrease in confidence, which consequently hinders the essence of physical literacy growth. In addition, play is typically defined as an unstructured and chaotic entity (Canning, 2007) therefore this discussion promotes 5 pedagogic principles to align a play-based approach, to develop physical literacy, within the educational system.

5.3.1.1 Constrain to Afford

Newell (1985) proposed a constraints-led model, in which motor competence was seen to not emerge naturally during early childhood but rather as a result of cooperating dynamic subsystems, namely the task, the learner and the environment. Considering this, an individual's movement is a product of the interaction within and between these dynamic, cooperating subsystems (Newell, 1985). Dynamical systems theorists depict that biomechanical degrees of freedom in the motor system (i.e. the number of independent parameters that define a system's configuration) are reduced through the development of coordination. This process encourages development of functionally preferred coordination states, which then support particular goal-directed behaviours (Brunswick 1944, in Dhami *et al.*, 2004: p. 962).

Utilising Newell's (1985) model, Davids (2010) imply that the constructed environment, and the changes that are made to it in-action (Schön, 1983), should offer learners the ability to explore different options and ways in which they interact with it. To conceptualise this, the parameters of the environment (Renshaw *et al.*, 2010) can be adapted either by the child's imagination (Kental and Dobson, 2007) or the task constraint (Newell, 1985) added by the teacher. By adapting the environment (e.g. by changing the size/shape of the area, increasing/decreasing numbers or changing the scoring system/goals or equipment) the child has to self-organise against the instability (Osberg and Biesta, 2010) to produce a new movement solution to (re)solve the problem. To conceptualise this principle using the domain-element framework, the child has to respond with new ideas, which for example incorporates the cognitive elements: confidence, motivation, decision-making and creativity; furthermore, to implement these ideas the child has to draw upon physical elements such as movement, cardiovascular endurance, coordination, balance, flexibility and speed. If the movement solution is successful, then this will enhance the child's confidence; which in turn positively perpetuates the child's engagement and enjoyment in physical activity.

5.3.1.2 Perception and Action Coupled

Handford *et al.* (1997) imply that the environment should trigger action, rather than the child having to be prompted and told what to do in-action. To conceptualise this principle using the domain-element framework, the child will perceive (awareness) information flows using their senses, and self-organise (Osberg and Biesta, 2010) to produce a movement solution (Renshaw *et al.*, 2010). If the movement solution is successful then this will not only create action-perception couplings (Davids, 2010), but foster confidence in their movement and coordination which therefore develops their movement and physical competence. It is to note that the more attuned an individual is to relevant information flows produced within the environment, then the more physically literate this individual is, as they will have the capacity to produce consistent, controlled and stable movement solutions more often (Bernstein, 1867). As such, it is vital that practitioners construct environments that afford children the opportunities to perceive and act so that children begin to recognise their affective, cognitive, physical and social potential through trial and error.

5.1.3.3 Repetition without Repetition

Bernstein (1967) implies that practitioners should create environments that afford individual's high amount of time on-task (i.e. decisions to make). To conceptualise this, Bernstein (1867) describes this principle in two phases. First, movement is *acquired* through practice, as although approximate motions are repeated, their exact form changes due to the changes in environment. Second, movement is *developed* into effective movement solutions for a wide range of environments; therefore, although the basic movement is repeated, the motions change to suit the circumstances. As a result, this principle recognises that individuals will begin to understand their human potential through interactions with the environment (Whitehead, 2007), which allows their movement solution to become transferable across different environments

(Chow *et al.*, 2016). Furthermore, this principle affords children the opportunity to (perceive and) act, therefore allowing the individual the capacity to recognise their affective, cognitive, physical and social potential through purposeful practice.

5.1.3.4 Managed Chaos

Chow *et al.* (2016) imply that practitioners need to manage the instability in the environment, so that learners can access learning. To conceptualise, if the environment – including the children within it – is considered a system, an effective learning environment considers the balance between the parameters of the environment and the amount of imbalance in the system (Renshaw *et al.*, 2010). This synergy creates a challenge without making the problem impossible to solve.

In the context of aligning physical literacy to the educational setting, this pedagogic principle is paramount. It is implemented utilising a constraints-led approach (Renshaw *et al.*, 2010) to condition and manage the environment. For example, for health and safety reasons it may be applicable to slow down the movement of children if the physical education lesson is in the school hall; furthermore, if the problem to solve is outside the child's zone of proximal development (Vygotsky, 1978) then the practitioner could, depending on the context, reduce the instability in the game. To provide context, this could be achieved by either increasing/decreasing the space, increase/decreasing the numbers or increasing/decreasing the equipment/goals in the area. For this principle to align with the physical literacy concept, it is vital that this manipulation of the environment affords the child to respond to the environmental triggers, rather than responding to external cues and being told what to do (Bernstein, 1967).

5.1.3.5 Purpose and Consequence

The literature review revealed that physical literacy is concerned with real-world interactions with the environment (Whitehead, 2007); therefore, this pedagogic principle allows physical literacy to be applied to practice, as a rich learning environment is defined by having tangible purpose for children to invest in (Renshaw *et al.*, 2010).

A traditional approach to physical education would be to give a child a ball and encourage them to practice particular skills with a partner (e.g. throw and catch the ball ten times with one hand); however, this example lacks purpose, as the movement solution (to catch with one hand) responds to the de-contextualised prompt of what to do, rather than the environment triggering the action of catching the ball with one hand (Bernstein, 1967).

Using the domain-element framework to conceptualise this principle in a playful environment, children could for example move from one area (i.e. boat) to another (i.e. a treasure island), pretending to be ‘sailors’ to move bean bags (i.e. treasure) back to their boat without being tagged (by the pirates at sea). If they are tagged whilst at sea then they have to return to their boat to start again. If the sailors are tagged at sea and are carrying treasure, then the treasure is dropped before going back to their boat to start again. The conformity of the game ensures that there is a decision to make regarding how the child moves, transports the bean bag back and how much treasure they are willing to risk losing at sea.

This learning environment has a tangible and realistic consequence to the action of being tagged. As such, the environment affords children to make creative decisions (i.e. change direction, increase speed or to throw the bean bag to a team mate) based upon their perception, to organise against the taggers and respond with an action to achieve the task. Consequently, this environment aligns to developing the underpinning elements of physical literacy, which in turn can help children to develop movement capacities, motivation and confidence; moreover,

this experience provides children with the premise to continue with exercise throughout childhood and beyond as it is perceived as enjoyable.

It is to note that implementing a consequence to movement solutions that do not abide to the conformity of the game are crucial to ensuring that the learning environment does not become unstructured free-play (Canning, 2007). As such, the constraint of dropping the bean bags and returning to the area in this example adheres to the previous principle of managing chaos.

The 5 pedagogical principles allow practitioners to implement the *domain-element* framework to create purposeful and meaningful environments to foster physical literacy within the educational setting. With this understanding, it is now the responsibility of practitioners to design effective environments for children to develop in. To fully achieve these principles within Key Stage 1 and 2 physical education lessons, it is recommended to decouple physical education and sport (YST, 2014) as these are separate entities (Lussier, 2010).

This rationale is made on the merit of the literature review, as although sport is one context to develop physical literacy (and if so the 5 pedagogic principles are applicable), it is recommended by the YST (2014) that competitive sporting concepts should be left for those that want to engage in them. Hence, the space for physical education should be designed to encourage the growth of a child's affective, cognitive, physical and social capacities. In doing so, this will enhance a child's engagement, enjoyment and motivation in physical activity; therefore, improving their relationship with exercise. Consequently, this is one step to improving an individual's daily moderate to vigorous physical activity level. It is suggested that by improving this (UK Active, 2014), the rate of childhood physical inactivity and obesity will decrease; furthermore, if children growing up are more active, they as parents, in around

20 years' time, will recognise the importance of physical literacy on their children's well-being (Higgs, 2010), therefore, positively perpetuating the cycle.

Tremblay and Lloyd (2010) indicate that assessment and evaluation are fundamental aspects of the educational sector; therefore, in order to align physical literacy with this sector, the final discussion needed before the concept can begin to embed mainstream policy is one around the notion of charting development/the physical literacy journey.

5.3.2 Re-establishing the Measurement Debate

The literature review revealed that a Whiteheadian approach stands in stark contrast with the ideology of measurement (McCaffrey and Singleton, 2013; Tompsett *et al.*, 2014; Lundvall, 2015). To reiterate, this is because assessment is restrictive and exclusionary; therefore, it is seemingly juxtaposed to a concept which is an individual disposition governed by self-awareness and holism (Whitehead, 2010; Taplin, 2012). As such, Chapter 2.2.4 indicated a dearth of research that pertains to conquering this juxtaposition, as there is no comprehensive or valid protocol to measure physical literacy provision (Tremblay and Lloyd, 2010). That said, this absence is limiting the adoption of the concept as a national approach (MacDonald and Enright, 2013), as it is considered that, in order to be incorporated within educational and health policy, it must adhere to its measurable landscape (Tremblay and Lloyd, 2010).

The audit-based culture (Tremblay and Lloyd, 2010) that schools find themselves a part of – perpetuated by the presence of Ofsted – has proven a significant influence on the realities of promoting physical literacy in primary schools (YST, 2014). Ofsted demands that observable learning takes place; learning that is centralised around explicit outcomes that the children are aware of and can articulate (Ofsted, 2015). However, physical literacy, as a concept is largely implicit and is individualised in nature (Jurbala, 2015). To reconcile this and relate to the

context of education, it is important that practitioners create learning environments that ask specific questions and give the children the space to explore the solutions within it, at their own pace (Canning, 2007). To align with Ofsted, it is vital that these problems are set against learning outcomes.

A by-product of the Delphi found that physical literacy is a process, that has an outcome. From this, it is possible that the same environment could entice different or multiple outcomes (Boing Kids, 2017); therefore, even if these are made explicit, these are not exclusive, or at the expense of enriching any other element of physical literacy during that particular lesson. Therefore, constructing carefully crafted learning outcomes means that Ofsted regulations are met, without compromising and reducing the essence of physical literacy to a discrete set of skills and competencies. However, prior to gaining consensus on the re-conceptualised framework, the pertinent question of measuring a Whiteheadian approach was considered a complex one, as it was unclear what elements conceptualised physical literacy. Without this information, it was impossible for practitioners to know what to look for in regard to a child's physical literacy development; therefore, this absence limited the scope to chart the concept. With consensus reached on the underpinning elements, practitioners can now identify the elements that constitute a physically literate individual.

However, it is to note that even though the Delphi found that the concept should be measured (see Chapter 4.4.3), consensus on the method of attaining this was not reached. As such, the findings from this study present the opportunity for academics to stimulate research, public engagement and further thinking into the methodology of charting physical literacy development.

6.0 Conclusion

This study is the first to gain consensus on the overarching philosophy, the definition and the underpinning elements of physical literacy. As a result, it re-aligns the physical literacy concept. In doing so, it not only overcomes the limitation presented by Edwards *et al.* (2016), but responds to Francis *et al.* (2016). 14 panellist experts took part in the study that took place between March 2017 and June 2017. The Delphi consisted of three rounds and was conducted via electronic surveys using Qualtrics Software Solutions. Following the three rounds, consensus was gained on the overarching philosophy, definition and the underpinning elements.

Embodiment, existentialism and phenomenology overarch the concept. As a result, this thesis resolves the fact that there are two approaches to conceptualise physical literacy (Edwards *et al.*, 2016). Consequently, as the Delphi consensus aligns with the Whiteheadian approach, the results refuse the LTAD model on the grounds that this approach is fixated with a dualistic ontology.

With philosophical clarity reached, the second limitation prior to this study, was the fact that competing definitions exist (PISE, 2016; PHE Canada, 2016; SHAPE America, 2016). It is to note that these definitions eroded the epistemological nuances of Whitehead's (2010) concept, which meant that organisations and practitioners reduced the essence of physical literacy to purely the mastery of fundamental movement skills (Edwards *et al.*, 2016). Consequently, this resulted in the LTAD approach gaining traction within the educational and health fields. In response, the Delphi consensus repositions IPLA's (2016) definition at the centre. In doing so, this thesis refuses the definitions put forward by Go2Play (2016), PISE (2016), SHAPE America (2016), PHE Canada (2016) and the Youth Sport Trust (2013) on the grounds that these definitions are connotations of the LTAD approach. As such, these pertain a desirable state and confer an overemphasis on physical competence; therefore, transpiring dualism.

With definitional clarity reached, the Delphi adds value in that it responds to Francis *et al.* (2016) and gains consensus on the constituent domains. As a result, practitioners are able to translate and apply physical literacy to practice, which overcomes the profound concern raised by the panellists in Round 2 (see figure 6). Consequently, this consensus maintains the original premise of Whitehead (2010) and Mandigo *et al.* (2012) respectively, but adds academic rigour in that it also connects elements to these conceptualisations.

The consensus statement (see Appendix 6) identified three elements that underpin the affective domain (confidence, motivation and self-regulation); nine elements that underpin the cognitive domain (awareness, communication, content knowledge, creativity, decision making, reaction-time, safety & risk, self-assessment, and understanding & reasoning); 12 elements that underpin the physical domain (agility, balance, cardiovascular endurance, coordination, flexibility, movement, movement using equipment, muscular endurance, posture, power, speed, and strength); and four elements that underpin the social domain (collaboration, connectedness, ethics, society & culture). As a result, these 28-elements expand upon the core-categories identified by Edwards *et al.* (2016), whilst supporting the ideology conceptualised by Keegan *et al.* (2016) and the clarification post presented on the IPLA's website. As such, these elements are entwined and are co-dependent. Therefore physical literacy is the blend of these elements (IPLA, 2014). This means that if one or more of the domains is lacking or lagging behind another, or individuals focus solely on one of the domains, then their capacity to be physically literate is affected.

To summarise, it is evident that over the course of two decades, physical literacy has been through considerable evolution. Originating from debates pertaining to existentialism and phenomenology (Whitehead, 2010; Edwards *et al.*, 2016), the concept begun to forge itself as an outcome of physical education curricula around the world (Delaney *et al.*, 2008; Higgs *et*

al., 2008; Mandigo *et al.*, 2009; Keegan *et al.*, 2013; YST, 2014); however, prior to this study, the epistemological pillars of physical literacy had become muddled, resulting in competing definitions to exist. These exist because of the effort to make the conceptualisation of physical literacy practitioner-friendly (Keegan *et al.*, 2016). In achieving this, the LTAD approach emerged; however, this approach reduced physical literacy to its simplest form – isolated motor-skill development. As a result, physical literacy was no longer viewed as an inherent human capacity, but rather a discrete set of skills to be taught and evaluated (Jurbala, 2015). The argument was that this reductionism was the result of an absence of an applicable and tangible pedagogic framework (see figure 6).

To conclude, the re-conceptualised pedagogical framework, which consists of the domain-element framework and the 5 pedagogical principles (as discussed in Chapter 5.3.1), adds value in that it allows practitioners to be better placed to apply the concept to their practice. This approach, corresponds with Whitehead (2010), Mandigo *et al.* (2012) and Edwards *et al.* (2016) in that physically literate individuals have the capacity to move with poise, fluidity and economy across a variety of different environments. Therefore, for an individual to be physically literate, they will not only have the capacity to produce movement solutions in isolation, but the disposition to produce them in scenarios reacting to stimuli to solve problems (Renshaw *et al.*, 2009, 2010; Lounsbery and McKenzie, 2015; Chow *et al.*, 2016). As such, a physically literate individual has the capacity to draw upon their affective, cognitive, physical and social elements to produce solutions to the environment that they are embodied within. The key to this re-conceptualisation is that this study identified physical literacy as a process, that has an outcome; as a result, this by-product responds to the definitions (see Appendix 1) that either highlighted physical literacy as a journey (i.e. a process) or a desirable outcome (i.e. a desirable state, which is to be achieved). It is to note that this complexity allowed practitioners to reduce the concept to its simplest form, via a behaviourist approach, in order to achieve the

desirable outcome of skill development. However, this clarity allows practitioners to respond and create learning environments in which the elements can be developed, which in turn allows for the development of more confident, motivated, skilled and knowledgeable individuals, who value physical activity and choose to participate for life.

The result of this study indicates that physical literacy is viewed, once again, as an inherent human capacity, which means that the social and health benefits of this ‘healthy living construct’ (Francis *et al.*, 2016: p. 214) can be re-established.

6.1 Recommendations for Future Research

Following the consensus statement, this study presents the following recommendations for future research: a) clarity on the evolvment and dissolvment of elements; b) implementing the new pedagogical model of physical literacy; and c) further thinking into charting physical literacy progress.

6.1.1 Evolvment and Dissolvment of Elements

Chapter 4.3 identified elements that are needed in order to produce movement solutions to the scenarios presented in everyday situations. However, it is worth noting that, like the chemical Periodic Table, elements may emerge and dissolve over time (Mendeleev, 1869). To conceptualise this, the development of modern technology may impact the underpinning cognitive and physical elements. As such, it is recommended that future research is transparent and clear in the evolvment and dissolvment of elements so that practitioners are informed of how this development impacts their practice.

Moreover, as the IPLA aims to promote the value of physical literacy worldwide by continuing to develop the concept through scholarly activity, it is suggested that the IPLA takes the responsibility for overseeing this process in the future.

6.1.2 Implementing the New Pedagogical Model

Following the discussion, this study recommends that Key Stage 1 and 2 physical education practitioners begin implementing the domain-element framework – using the 5 pedagogical principles – in their practice. As such, this study asks for practitioners to use this pedagogical model across the educational system, as this will test the practicality of delivering physical literacy provision. It is to note that the Research Team would welcome any feedback from practitioners using this re-conceptualised model of physical literacy within their practice.

6.1.3 Further Thinking into Charting a Whiteheadian Approach

In order to align physical literacy to the educational and health sectors, chapter 4.4.3 identified the notion that the concept should be measured; however, consensus on the method of attaining this was not reached. It is to note, that as a starting point, one panellist suggested the use of a matrix – related to the four domains – where subjective observations are made in relation to the underpinning elements. As a result, it is recommended that academics and practitioners use Appendix 2.1 and the domain-element framework to stimulate research, public engagement and further thinking into the methodology of measuring/charting the physical literacy journey, via a Whiteheadian approach.

6.2 Limitations

The limitations of this study are: a) the use of only English-speaking participants alongside the uneven split of panellist location and area of expertise; b) the subjectivity of data collection and analysis process; and c) the potential of forced consensus, due to the use of Delphi methodology.

6.2.1 *The Use of English-speaking Participants and Uneven Distribution of Panellists*

The literature review outlined that physical literacy is an international concept; therefore, the use of only including English-speaking participants in the Delphi panel was considered a limitation. However, as Chapter 3.7.2 outlined, panel members that possessed English fluency was a participation criterion, as this corresponded with a) the language of the Principal Researcher and b) the intention to write-up the findings in English.

Furthermore, the split of geographical location and area of expertise of the panellist experts was not even; therefore, this is also considered a limitation. However, as this study was looking at physical literacy in the context of the United Kingdom, this uneven split is justified. In addition, the inclusion of the *society and culture* element underpinning the social domain, overcomes Corbin's (2016) concern that because societies have different cultures, the way in which physical literacy is defined may vary.

6.2.2 *The Subjectivity of the Data Analysis Process*

Delphi methodology is applicable in research areas where there is little prior research or where advantage could be realised in the collective subjective judgements of panellist experts (Hejblum *et al.*, 2008); moreover, like any research design, Delphi provides benefit and value when it is determined to be the most suitable approach to address the research question. Yang *et al.* (2012) noted its suitability for studies that exhibit subjective expertise and judgemental inputs. Therefore, whilst it is considered a methodological limitation, this is overcome by Yang *et al.*'s (2008) justification alongside the coding process (Jones, 2015).

6.2.3 *The Potential of Forced Consensus*

Whilst the purpose of Delphi methodology is to gain consensus, this in itself is considered a limitation due to the by-product of potentially forcing consensus. However to overcome this,

as the Delphi progresses through each round, responses to each round receive increasing or decreasing mention. According to Keeney *et al.* (2001), Hanafin (2004), and Hsu and Sandford (2007) this results in an outcome which is acceptable to all. Please note, that consensus does not mean 100% agreement, as unanimity might be extremely difficult to attain as panellists often represent different viewpoints and priorities (Keeney *et al.*, 2001). Instead, Delphi consensus ranges from 55 to 100% agreement, with 75% considered the standard (Vernon, 2009).

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6.4 Conflict of Interests

The Principal Researcher declares there to be no conflict of interest.

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Appendices

1. Analysis of Current Definitions
2. Analysis of Common Physical Literacy Assessment Protocols
 - 2.1 Protocols' Fidelity to Physical Literacy Domains
3. E3 Ethics Approval Form
4. Participant Welcome Letter
5. Delphi Pilot
 - 5.1 Round 1
 - 5.2 Round 2
 - 5.2.1 Tracking of Definitional Response Between Round 1 to Round 2
 - 5.2.2 List of Elements Collated from Round 2
 - 5.3 Round 3
6. Consensus Statement

Appendix 1 – Analysis of Current Definitions

Definition	Source	Comments
Physical literacy is defined as a disposition to capitalise on the human embodied capability, wherein the individual has the motivation, confidence, knowledge and understanding to value and take responsibility for engaging in physical activities for life.	Whitehead (2001)	Early conceptualisation of physical literacy, formulated through Whitehead's PhD. Originated from philosophical schools of thought in existentialism and phenomenology. Explicit in the concept being a disposition
As appropriate to each individual's endowment, physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding to maintain physical activity throughout the life course.	Whitehead (2010)	Similar wording as above, but with addition 'to each individual's endowment'.
Physical literacy is the mastering of fundamental movement skills and fundamental sport skills that permit a child to read their environment and make appropriate decisions, allowing them to move confidently and with control in a wide range of physical activity situations	Pacific Institute of Sport Excellence (PISE)	Highly focused on motor skills and perceptual aspects of 'reading' the environment. Does acknowledge confidence, but little mention of other psycho-social factors that may facilitate lifelong physical activity.
Physical literacy is the ability to move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person.	SHAPE America – conferred by Mandigo, Francis, Lodewy & Lopez (2012) <u>also</u> <i>Canada Passport for Life</i> (PHE Canada, n.d)	As above – motor skills and confidence are addressed, but little mention of other psycho-social factors that may facilitate lifelong physical activity. 'Whole person' element captures holistic nature Clearly pertains to a desirable yes/no state, not the developmental journey/process Focus on physical activity but not movement – may reflect health emphasis.
Physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life (Whitehead, 2016).	ILPA website (IPLA, 2016)	Arguably the main source of the big four – motivation, confidence, competence and knowledge/values. Why were these specific attributes chosen? Still appears to describe a desirable/aspirational state, not the process of getting there. Focus on physical activity but not movement – may reflect health emphasis. 'For life' implies throughout life and for health.
The motivation, confidence, physical competence, understanding and knowledge to maintain physical activity at an individually appropriate level, throughout life	NSW DEC – conferred by Whitehead and Murdoch (2006)	Closely related to IPLA version above. Underpinned by recent NSW Physical Literacy Continuum. When looked into, FMS dominate practice

<p>Physical literacy means that a person has a catalogue of technical skills along with the confidence and motivation to take part in lots of different sports and physical activities at every stage of their life.</p> <p>It gives them the power to choose to be physically active in whatever they prefer, taking away fears of ‘having a go’ or a lack of motivation that many of us can suffer from.</p> <p>There are 4 individual elements that lead to a person becoming physically literate... Physical Skills + Confidence + Motivation + Lots of opportunities = Physical literacy</p>	<p>Sport Wales (2015)</p> <p>Sport Wales cont.</p>	<p>Different wording to above, but still emphasises skills, confidence and motivation. Additional emphasis on:</p> <ol style="list-style-type: none"> 1. Empowering the individual 2. Opportunities being a vital consideration <p>Focus on physical activity but not movement – may reflect health emphasis</p>
<p>Individuals who are physically literate move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person.</p> <p>Physically literate individuals consistently develop the motivation and ability to understand, communicate, apply, and analyse different forms of movement.</p> <p>They are able to demonstrate a variety of movements confidently, competently, creatively and strategically across a wide range of health-related physical activities.</p> <p>These skills enable individuals to make healthy, active choices that are both beneficial to and respectful of their whole self, others, and their environment.</p>	<p>PHE Canada (2016)</p>	<p>Same wording as SHAPE America – with addition of new statements and/or clarifications</p> <ol style="list-style-type: none"> 1. Addition of ‘developed’ motivation and understanding 2. Addition of creative and strategic 3. Addition of whole self, others and the environment <p>Still appears to invoke a desirable/aspirational state to be pursued/achieved, not a process/journey</p> <p>Focus on physical activity but not movement – may reflect health emphasis</p>
<p>Individuals who are physically literate move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person.</p> <p>Why is it important?</p> <p>Physical literacy provides a solid foundation for children and youth to develop the skills, knowledge and attitudes they need to enable them to engage with poise and confidence across a wide variety of activities. The development of physical literacy is now a reality for educators and practitioners and many provincial physical education curricula now identify the development of physically literate students as the major outcome of physical education programs.</p>	<p>PHE Canada (2016)</p>	<p>As above – with the addition of new statements and/or clarifications</p> <ol style="list-style-type: none"> 1. Addition of ‘why is it important?’ 2. Clarification as a ‘solid foundation for children’ – queries when this desired level/state’ is reached and how high the bar is. <p>Still appears to invoke a desirable/aspirational state to be pursued/achieved, but a process/journey</p> <p>Focus on physical activity but not on movement – may reflect health emphasis</p>

To be physically literate includes the ability to move with poise and confidence across a wide range of activities. It also includes competencies that are linked to the development of the whole person (e.g. physical, affective, cognitive). Recent definitions of physical literacy include the importance of psycho-social aspects such as motivation, social responsibility, self-esteem and culture	Mandigo, Francis, Lodewyk and Lopez (2012)	Concept paper – arguably the first appearance of the distinction between: <ol style="list-style-type: none"> 1. Physical 2. Affective 3. Cognitive 4. Social
To be physically active individuals call on their affective, cognitive and physical domains . They need to be motivated, confident and competent. These elements are entwined and are co-dependent – physical literacy is the blend of these elements. If one or more of the elements is lacking, or lagging behind the other elements (or we focus solely on one element) the capacity to be physically active is affected.	IPLA clarification post, 2014) IPLA cont.	Clarification clearly donates 3 of the four domains highlighted by Mandigo <i>et al.</i> (2012) above Re-emphasis on integrated/holistic nature
Physical literacy is defined as lifelong holistic learning acquired and applied in movement and physical activity contexts. It reflects on-going changes integrating physical, affective, cognitive and social capabilities. It is vital in helping us lead healthy and fulfilling lives through movement and physical activity. A physically literate person is able to draw on their integrated physical, affective, cognitive, and social capabilities to support health, promoting and fulfilling movement and physical activity – relative to their situation and context – throughout the life span	Australian Sports Commission – conferred by Keegan <i>et al.</i> , (2016)	Aim to make the concept practitioner friendly to different groups. Provide a working definition that can underpin education and health policy in Australia. Takes Mandigo <i>et al.</i> 's domains forward and reemphasises that it is an ongoing process related to fulfilling a healthy lifestyle.
Physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding that provides children with the movement foundation for lifelong participation in physical activity. Enabling them to be physically literate supports their development as competent, confident and healthy movers.	YST Physical Literacy Framework (2014)	Developed in partnership with SE, afPE, scUK and CSPn. Similar wording at IPLA. Additional emphasis on child context and movement foundation. Physically literate? Supports competent, confident and healthy movers. View that developing physical literacy is the foundation of PE and school sport. Physical literacy is not a programme, rather it is an outcome of any structured PE and school sport provision, which is achieved more readily if learners encounter a range of age and stage appropriate opportunities.
Physical literacy is the understanding and awareness of how I interact with the environment around me. A physically literate child is a confident and creative child who moves fluently.	Boing Kids (2014)	Emphasis on Embodiment and interaction with the environment. View physical literacy as a pluralism of physical literacies

<p>The ability to use the body and mind for a range of physical activities.</p> <p>The foundation of physical literacy is FUNdamental movement skills, with fun being the motivating factor for children. These can be developed through varied and enjoyable play.</p>	<p>Go2Play (Scotland) (2016)</p>	<p>Over emphasis on physical competency and FMS.</p> <p>Dualist view of body and mind</p>
<p>View physical literacy as developing ABCs</p>	<p>Youth Sport Trust (2013) - Start to Move</p>	<p>Emphasis on physical competence and FMS.</p>

Appendix 2 – Analysis of Common Physical Literacy Assessment Protocols

Assessment tool	<i>CAPL</i>	<i>Passport for Life</i>	<i>PLAY (PLAYfun)</i>
Organisation	HALO (2014)	PHE Canada (n.d)	CS4L (2015)
Ages	8 - 12	Grades 3 - 12	7 +
Applications	Advocacy, monitoring and evaluation; surveillance	Formative assessment in (physical) education; engagement and awareness.	Program evaluation and research; formative assessment, screening, surveillance, engagement
Assessment Categories	Physical competence (32%), daily behaviour (32%), knowledge and understanding (18%), motivation and confidence (18%)	Fitness skills, movement skills, active participation, living skills	Competence, comprehension and confidence (related to 18 movement tasks)
Assessment measures	Objective measures (using four-stages rubrics) for physical competence (based on movement battery of fitness assessments and anthropometric measurements), daily behaviour, (based on step count and self-reported moderate to vigorous physical activity [MVPA] and sedentary time); self-reports for knowledge and understanding & motivation and confidence (based on questionnaire responses).	Objective measures (using four-staged rubrics) for fitness skills and movement skills; self-reports for active participation (without performance measures) and living skills (using four-staged rubrics)	Objective measures using (two- and four-staged rubrics) for competence and comprehension; objective measures (using an analytic scale) for confidence.
Performance Descriptors	Physical competence, daily behaviour, knowledge and understanding, motivation and confidence: performance is labelled as beginning, progressing, achieving or excelling.	Fitness skills, movement skills, and living skills: performance is labelled as emerging, developing, acquired or accomplished. Active participation: performance is not measured but information related to diverse activities and environment is summarised.	Competence: performance is labelled as developing (which includes initial – 0 to 23% and emerging – 25 to 50%) or acquired (which includes competent – 50 to 75% and proficient – 75 to 100%). Comprehension: is labelled as prompt, mimic, describe or demo. Confidence: performance is labelled as low, medium or high
Assessment time (for 1 assessor with 1 class)	Four class lessons	Three class lessons	Unidentified (estimated to be at least four class lessons)
Assessment materials	Activity space; balls and cones; anthropometric tools (e.g. scale, measuring tape, callipers)	Activity space; balls and cones, computers with internet.	Activity space; balls, cones and sticks
Targeted assessors	Physical activity professionals, CAPL trained appraisers, physical education teachers – 2 assessors are necessary (1 male and 1 female)	Physical education teacher or generalist teacher	Trained professional (e.g. sport and recreation practitioners, physical education teachers)

Appendix 2.1 – Protocols’ Fidelity to Physical Literacy Domains

Assessment tool	<i>CAPL</i>	<i>Passport for Life</i>	<i>PLAY</i>
Affective	<ul style="list-style-type: none"> - Worth 18% of the overall physical literacy score. - Assessed via a questionnaire. - Self-expressions and non-verbal communication are not assessed. 	<ul style="list-style-type: none"> - Addressed via the Living Skills questionnaire. - The Living Skills questionnaire specifically asks about the individual’s ability to interact with others. - This is the only assessment instrument that addressed the interaction with others. 	<ul style="list-style-type: none"> - Motivation is not addressed (it is assumed that if the individual has competence and confidence in skills assessed, they will be motivated to participate. - Confidence is addressed, though weakly. After observing and scoring the motor task, the assessor is asked to indicate whether the child had low, medium or high confidence when performing the task - Self-expressions and non-verbal communication are not assessed.
Behavioural (Social/Cultural)	<ul style="list-style-type: none"> - Worth 18% of the overall physical literacy score. As with all categories, the physical literacy labelling is assigned (beginning, progressing, achieving or excelling in one’s physical literacy journey) is based on norms for each age group (8-12 years). - The manual states that regardless of label assigned, there is always room for improvement, as physical literacy is a lifelong journey. - Assessed via tracking steps taken over a seven-day period as well as from questions asking about sedentary time and engagement in MVPA. 	<ul style="list-style-type: none"> - Lifetime journey is assessed. Suggestion is made that the assessments be administered at least twice per year, preferably at the beginning and end. The check-in assessment is designed to track progress across testing sessions. - Active Participation questionnaire attempts to capture the range of activities and the environments in which the individual participates in physical activity. 	<ul style="list-style-type: none"> - The element of physical literacy being a personal journey is addressed. The instrument is intended to track progress, and there is a tracking sheet for recording scores over multiple assessment dates. The tracking form is for the 18 tasks addressed in the instrument only. An inventory sheet plus room to add others is also available. Individuals check those activities they have participated in regularly over the past 12 months. The inventory sheet is not scored, nor is it included as part of the physical literacy assessment score. The <i>PLAYself</i> instrument is designed to be used

			by individuals to track and assess their own physical literacy. The instrument is a scored questionnaire, asking questions about the environment in which activities are engaged in.
Cognitive	<ul style="list-style-type: none"> - Worth 18% of the overall physical literacy score. - Assessed via a questionnaire asking questions about physical activity and screen time guidelines, definitions of cardiorespiratory fitness and muscular strength and endurance, the meaning of being healthy, safety gear when participating in activity, how to improve skill and fitness, and preferred leisure time activity. 	<ul style="list-style-type: none"> - The Living Skills questionnaire captures the degree in which students understand the health benefits of an active lifestyle, how they feel about their own abilities, and their current state of health. - The Post Assessment Goal Setting element of the assessment asks students to identify how they can improve on their results. - Safety and identifying quantities that influence movement are not directly addressed. 	<ul style="list-style-type: none"> - Knowledge and comprehension are not addressed as intended comprehension is judged by the degree to which the individual understood the task to be completed. If the individual completed the task as intended, they are assumed to have comprehended the task. If they need a prompt, or they need to see someone else complete the task first (mimic), or they require additional descriptions or a demonstration, they are assumed to have not fully understood the task and it is noted on the assessment sheet. - The <i>PLAYself</i> tool asks 12 questions meant to assess the individual's self-efficacy. Additionally, individuals can agree or disagree that they possess an appropriate level of fitness to participate in desired activities.
Physical	<ul style="list-style-type: none"> - Worth 32% of the overall physical literacy school. - Measured via standardised PACER test, obstacle course, grip strength, BMI percentile, wrist 	<ul style="list-style-type: none"> - Addressed via three fitness assignments (balance/dynamic strength, core strength and cardiovascular endurance) and the three movement 	<ul style="list-style-type: none"> - Physical competence is addressed: the instrument assesses 18 different fundamental and sport related skills.

	<p>circumference and flexibility (sit and reach test).</p> <ul style="list-style-type: none"> - The obstacle course testing fundamental movement skills (1- and 2-foot jump, slide, catch, throw, skip and kick) attempts to have individuals demonstrate their use of the skills in a dynamic environment and adjust their movements according to the environment. 	<p>skill assessments (locomotor, throwing and catching, kicking/punting).</p> <ul style="list-style-type: none"> - The movement skill assessments combine skills (e.g. throw and catch, or run, side shuffle, and back pedal). The assessments force individuals to demonstrate their ability in a game-like or play-like context; this appears to be an attempt to have individuals demonstrate their use of the skills in a dynamic environment so that they may adjust their movements according to the environment. - This is the only instrument where the assessments increase in complexity for each age to note the increased ability that is expected with age and experience 	<p>Individuals are scored on the degree to which their performance matches pre-set criteria.</p> <ul style="list-style-type: none"> - A variety of movement intensities and durations is not addressed: intensities and durations of the assessments are all short in duration and are all anaerobic in nature. With respect to settings, all assessments are to be carried out either in a gym or on a playing field. The intention of these criteria is that individuals can adapt their movements to different environments. - Adapting to the environment is not addressed. The assessments are closed tasks of individual skills. - The <i>PLAYself</i> instrument allows the individual to self-rapport those environments where they feel competent participating.
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Oxford Brookes University
Faculty of Health and Life Sciences
Decision on application for ethics approval

The Departmental Research Ethics Officer (DREO) has considered the application for ethics approval for the following project:

Project Title: A Delphi Study to Gain Consensus in Measuring Physical Literacy Development in Children

DREC Reference: 1216_27

Name of Applicant/s: Chris Cutter

Name of Supervisor/s: Will Roberts

Please tick one box

1. The Departmental Research Ethics Officer / Faculty Research Ethics Committee gives ethical approval for the research project.

☒


Please note that the research protocol as laid down in the application and hereby approved must not be changed without the approval of the DREO / FREC

2. The Departmental Research Ethics Officer / Faculty Research Ethics Committee gives ethical approval for the research project, subject to the following::

☐

3. The Departmental Research Officer / Faculty Research Ethics Committee cannot give ethical approval for the research project. The reasons for this and the action required are as follows:

☐

Signed: 

Approval Date: ...18/01/2017.....

Designation: Departmental Research Ethics Officer

(Signed on behalf of the Faculty Research Ethics Committee)

Date when application reviewed (*office use only*):.....06/12/2016.....

Appendix 4 – Welcome Letter and Participant Information Sheet

21st March 2017



Dear Sir/Madam,

Re: A Delphi Study to Gain Consensus on the Definition, Domains and Elements of Physical Literacy.

You have been identified by the research team as an expert in one of the following disciplines: physical literacy, physical education, psychology, physiology, sociology, human movement or assessment. I am therefore contacting you to enquire if you would be willing to take part in a Delphi study that seeks to gain consensus on defining and further understanding Physical Literacy. I am undertaking this study as part of a Postgraduate Degree towards a Masters by Research at Oxford Brookes University. The project has gained full ethical approval, which I am happy to share with you, if required.

The study will require you to complete 3 online surveys, over a period of six weeks. Each survey will take no longer than 20 minutes to complete and you will have two weeks to complete each survey. Below is a brief background to the study:

Physical Literacy is a complex concept and despite efforts to theorise and conceptualise the term, there still exists a lack of adherence to its original premise - that of speaking to the embodied nature of our existence (Whitehead, 2001, 2007, 2009, 2010). These efforts have resulted in research groups and educational organisations around the world defining and implementing the concept differently (Edwards et al, 2016).

My research focuses on the definition and application of Physical Literacy in practical settings; and will seek to explore the ways in which we understand, define, implement and chart progress in Physical Literacy. For that reason, I am looking for your participation in this Delphi study so that we might gain consensus on the definition, domains and elements of Physical Literacy, in order to bridge the academic-practice gap.

I have attached a participant information sheet below.

If you are interested in taking part in this study, please email 15109373@brookes.ac.uk **by midday on the 28th March 2017**. Furthermore, if you have any further questions regarding this project, please do not hesitate to contact me.

Kind regards,

A handwritten signature in black ink that reads "Kit Cutter".

Christopher (Kit) Cutter - Principal Researcher

Participant Information



Research Team

Principal Researcher: Christopher (Kit) Cutter
Email: 15109373@brookes.ac.uk

Principal Investigator: Will Roberts
Email: wroberts@brookes.ac.uk

How have I been recruited to participate in this project?

20 experts, of which you are one, have been identified by the research team, via existing literature, pertaining to the field of physical literacy, physical education, psychology, physiology, sociology, human movement or assessment.

Do I have to take part?

No. Nobody will be/is forced to take part and there are no incentives to participate, nor costs/consequences for declining to participate. Likewise, you may withdraw from the research after it has started, with no risk or consequence. The same opportunities to decline or withdraw are available to everybody involved.

If you do participate, you do have the option to leave any questions blank that you feel uncomfortable answering. Please note that whilst you are under no obligation to answer any of the questions, the more information that you are able to provide, will enhance the richness of data and strengthen the outcomes that may be drawn from the results. Participating experts who do not respond to each round by the given deadlines may be withdrawn from subsequent rounds. If this is the case, this will be documented in the results.

What are the possible disadvantages and risks of participation?

There are no anticipated risks or disadvantages associated with taking part in online surveys. Great care will be taken to ensure that any findings drawn from the data do not allow identification of individuals from outside sources and raw data will not be published in any resulting reports. Following the Delphi, there will be an opportunity for you to undersign the result of the study, this will ensure that the participants have been represented correctly.

What do I need to do if I am happy to take part?

Please email 15109373@brookes.ac.uk by midday on the 28th March 2017 indicating that you are willing to take part. Following this, you will then be sent the first online survey on the 29th March 2017.

What do I need to do if I am not happy to take part?

Nothing. Please simply do not reply.

Will my participation in the study be kept confidential?

Yes. The only people who will have access to the responses you give will be the research team, named above. All data collected by this study will be secured and stored on a password locked computer system, as in agreement with the university ethics regulations. None of the information that you provide will be reported in a manner that allows the identification of individuals in relation to specific data points. The research outcomes will be presented in a dissertation, which will be submitted in part fulfilment of the regulations for the MA(Res) Degree at Oxford Brookes University.

ETHICS COMMITTEE CLEARANCE

The project has been approved by The Health and Life Science Departmental Ethics Committee at Oxford Brookes University.

QUESTIONS AND CONCERNS

If you have any queries regarding the questions in the survey, the research project in general or the storage of data, then please do not hesitate to contact the research team. Their contact details are above. Alternatively, you can contact Anne Delextrat, the Departmental Research Ethics Officer (adelextrat@brookes.ac.uk).

Appendix 5 – Delphi Pilot

Dear 'Expert'

Thank you for agreeing to participate in this research study.
The aim of this study is to reach a consensus on the definition, the domains and the elements of physical literacy.

Participant involvement

You will be required to complete three rounds of discussions, over the course of six weeks. The themes to each round are as follows:

Round 1 - Defining and Understanding Physical Literacy and the Relevant Underlying Domains
13th March 2017 - 22nd March 2017

Round 2 - Identifying the Elements that Underpin These Domains.
27th March 2017 - 05th April 2017

Round 3 - Discuss How These Elements Might be Measured?
10th April 2017 - 19th April 2017

Research Team

Principle Investigator

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Principle Researcher

Christopher Cutter, BSc (Hons)
Faculty of Health and Life Science, Oxford Brookes University
Email: 15109373@brookes.ac.uk

Participant Information

How have I been recruited to participate in this project?

20 experts, of which you are one, have been identified by the research team, via existing literature, pertaining to the field of physical literacy, physical education, psychology, physiology, sociology, human movement or assessment.

Do I have to take part?

No. Nobody will be forced to take part and there are no incentives to participate, nor costs/consequences for declining to participate. Likewise, you may withdraw from the research after it has started, with no risk or consequence. The same opportunities to decline or withdraw are available to everybody involved.

If you do participate, you do have the option to leave any questions blank that you feel uncomfortable answering. Please note that whilst you are under no obligation to answer any of the questions, the more information that you are able to provide will enhance the richness of data and strengthen the outcomes that may be drawn from the results. Participating experts who do not respond to each round by the given deadlines may be withdrawn from subsequent rounds. If this is the case, this will be documented in the results.

What are the possible disadvantages and risks of participation?

There are no anticipated risks or disadvantages associated with taking part in online surveys. Great care will be taken to ensure that any findings drawn from the data do not allow identification of individuals from outside sources and raw data will not be published in any resulting reports. Following the Delphi, there will be an opportunity for you to undersign the result of the study, this will ensure that the participants have been represented correctly.

What do I need to do if I am happy to take part?

Please indicate your consent below and then respond in full to the survey that follows. This allows you to indicate that you give consent to take part in the study, and that you understand the level of involvement.

What do I need to do if I am not happy to take part?

Click 'No, I do not feel able to participate', below. This will terminate this survey.

Will my participation in the study be kept confidential?

Yes. The only people who will have access to the responses you give will be the research team, named above. All data collected by this study will be secured and stored on a password locked computer system as in agreement with the university regulations. None of the information that you provide will be reported in a manner that allows the identification of individuals in relation to specific data.

points. The research outcomes will be presented in a dissertation, which will be submitted in part fulfillment of the regulations for the MA(Res) Degree at Oxford Brookes University.

Ethics Committee Clearance

The project has been approved by The Health and Life Science Departmental Ethics Committee at Oxford Brookes University.

Questions and Concerns

If you have any queries regarding the questions in the survey, the research project in general or the storage of data, then please do not hesitate to contact the research team. Their contact details are at the top of this page. Alternatively, you can contact Anne Delextat, the Departmental Research Ethics Officer (adelextat@brookes.ac.uk).

Consent

Do you agree with the following statements?

1. I confirm that I have read and understood the information sheet for the above study
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. Furthermore, I understand that such refusal or withdrawal would hold no negative consequences for me.
3. I have been advised of the potential risks associated with this study and I have had an opportunity to ask the research team any questions that I may have about the study and my participation.
4. I understand that the data collected will be used for the purpose of a Postgraduate dissertation, poster and/or conference presentation, and I consent for it to be used in that manner. Any information that I provide will remain strictly confidential.

By clicking 'yes' below, I am indicating my consent to participate in the research as described in the information provided.

- ☒ Yes, I understand and agree to participate
- ☐ No, I do not feel able to participate

. Which best describes your field of work?

(The drop down list is presented in alphabetical order)

Psychology ▼

. As you selected 'other', please specify

This question was not displayed to the respondent.

Round 1

Defining and Understanding Physical Literacy and the Relevant Underlying Domains
To be completed by 23:59 on the 22nd March 2017

Q1. How do you currently define physical literacy?

Please feel free to use either your own words or text from an existing definition

Core: Physical literacy is lifelong holistic learning acquired and applied in movement and physical activity contexts. Constructs: It reflects ongoing changes integrating physical, affective, cognitive and social capabilities. Importance: It is vital in helping us lead healthy and fulfilling lives through movement and physical activity. Aspiration/Aim: A physically literate person is able to draw on their integrated physical, affective, cognitive, and social capacities to support health promoting and fulfilling movement and physical activity - relative to their situation and context - throughout their lifespan.

Q1.1.

In your opinion, what are the strengths or positive attributes of the definition that you have provided above?

Please list up to 5

Separates/distinguishes between literacy (that we all have, process) and sufficiently 'literate' (the aim, a desirable level/outcome) - these are often conflated into the same thing but something we all have is a lot more inclusive than something only very few have. Adopts different core constructs than motivation, confidence, competence and knowledge - these have quite vague and nebulous interpretations and do not transfer well between cultures. I would argue they also put too much emphasis on the individual being motivated and driving the process, which is not really how motivation works. The above defining statements are more consistent with UNESCO's definition of literacy in the broadest sense, as something that makes you more able to engage with the world and learn/benefit from being in the world - far beyond reading and writing. The above defining statements put a heavy emphasis on integration and holistic nature - mentioning them 3 times. Many existing definitions overlook this and permit/encourage a chocolate block approach - "break off the piece you want and away you go". The above defining statements are inclusive in trying to acknowledge people will have specific constraints and challenges in their specific situation/context.

Q1.2. In your opinion, what might be the weakness or problems with the definition that you have provided?

Please list up to 5

I guess people might claim to be confused by not having a simple statement, or by not talking about physical activity - but I think you can double dissociate PA from PL. Not commonly known yet and still waiting for formal release/publication....! Although I would note that popularity is not an indicator of truth or veracity. One criticism was that 'isn't this just the same as physically educated'. I would say - to a physical educator, yes, but to most people you can get these capabilities many other ways than formal PE. People don't yet know what things like affective mean, but.... there is a dictionary for that....

Q1.3. In your opinion, is the definition that you have provided process or outcome driven?

- ☐ Physical literacy is process driven
- ☐ Physical literacy is outcome driven
- ☒ Physical literacy is both a process and an outcome
- ☐ Not sure

Q1.3.1. Please provide up to 5 reasons to support your answer

This question was not displayed to the respondent.

Q1.3.2. Please provide up to 5 reasons to support your answer

This question was not displayed to the respondent.

Q1.3.3. Please provide up to 5 reasons to support your answer

I think the UK/Whitehead gang tend to focus on process whereas the CS4L gang seem more worried about outcomes/levels. Neither are completely wrong, but the complex/process is extremely hard to measure and observe, whereas we can have a stab at evaluating product/performance - yet both are deeply connected and you can (very) loosely infer the internal processes when evaluating performances and especially changes in performance over time.

Q2. In your opinion, are there any assumptions that are made when defining physical literacy?

- ☒ Yes
- ☐ No
- ☐ Not sure

Q2.1. In your opinion, what are these assumptions?

We tried to eradicate them in the ones I suggested, but people have tried to define PL as both process and outcome, both a thing as well as it's constructs (or constituent parts), both a thing and the consequences of the thing, and in the case of PA, they have tried to define an antecedent/cause as synonymous with PL. It has, historically, been a massive mess.... Also people assume it's only aimed at kids which is nonsense - everyone has it, perhaps even every living creature.

Q2.2. Please comment, as to why you do not think there are any assumptions made when defining physical literacy?

This question was not displayed to the respondent.

Q3.

From your experience, please indicate which of the following are core to your definition of physical literacy?

Drag and drop each notion into the relevant box.

N.B Please do not omit any notions.

You will notice some overlapping notions. In this first round, do not worry about this. Feel free to use the open comments box at the end to suggest any changes.

(The following are presented in alphabetical order)

Items

Core to the definition of physical literacy	
Whole person / embodiment	1
Interaction with the environment	2
Development of the whole person	3
For life/throughout life/lifelong participation/engagement in physical activity	4
Neither agree nor disagree that this is core to the definition of physical literacy	
To take part in lots of different sports	1
Understanding emotions / relating to others	2
Strategy / tactics	3
Competence	4
Unique journey	5
Value and take responsibility for physical activity	6
Sporting success	7
To take part in lots of different physical activities	8
To understand, communicate, apply, and analyse different forms of movement	9
Social development	10
Speed	11
Support from significant others	12
Spirituality	13
Flexibility	14
Self-esteem	15
Reaction time	16
Spacial awareness	17
Physical fitness	18
Religion / Faith	19
Perceptions of own physical competence	20
Physical competence	21
Physical education	22
Physical activity	23
Participation in sport	24
Occurring in adults	25
Mastering of fundamental movement skills (FMS)	26
Move with competence	27
Occurring in childhood and adolescence	28
Move with confidence	29
Mastering of fundamental sport skills	30
Motivation	31
Individual endowment	32
Make appropriate decisions	33
Knowledge and Understanding to value and take responsibility for engagement in physical activity	34
Developing physical skills	35
Confidence	36
Ethnicity	37
Empathy	38
Culture	39
Creativity	40
Ability to read the environment	41
Decision making	42
Coordination	43

	Able to demonstrate a variety of movement confidently, competently, creatively and strategically	44
	Balance	45
	Agility	46
Not core to the definition of physical literacy		
Not sure		

Q3.1. In your opinion, are there any other notions that are core to the definition of physical literacy that are missing from this list above?

Please list and justify

Learning - the capacity for adaptive (and maladaptive) changes within the individual and/or system they inhabit

Q4. In your opinion, which philosophical underpinnings (if any) are core to your definition of physical literacy?

Again, Drag and drop each notion into the relevant box.

N.B Please do not omit any notions

You will notice some overlapping notions. In this first round, do not worry about this. Feel free to use the open comments box at the end to suggest any changes.

(The following are presented in alphabetical order)

Items

Core to the underpinning of the definition	
Critical realism - (describe an interface between the natural and social worlds)	1
Embodiment - (mind and body are one)	2
Subjectivity - (the quality of being based on influences by personal feelings or opinions)	3
Monism - (theory that denies the existence of a distinction or duality in a particular sphere, such as that between body and mind)	4
Existentialism - (individual's unique perspective of the world, arises due to the experiences of interacting with the world around us)	5
Not core to the underpinning of the definition	
Pragmatism - (a philosophical movement that includes those who claim that an ideology is true if it works satisfactorily, that the meaning or a proposition is to be found in the practical consequences of accepting it, and that impractical ideas are rejected)	1
Post positivism (Whilst positivists believe that the researcher and the researched person are independent of each other, postpositivists accept that theories, background, knowledge and values of the researcher can influence what is observed)	2
Phenomenology - (the way in which an individual perceives the world from their unique point of view)	3
Objectivity - (a philosophical concept, related to reality and truth. Generally means the state of being true even outside of a subject's individual biases, interpretations, feelings and imaginations)	4
Dualism - (the division of something conceptually into two opposed aspects e.g. body and mind as separate)	5
Positivism - (a philosophical system recognising only that which can be scientifically verified or which is capable of logical or mathematical proof).	6
Empiricism - (all knowledge is based on experience derived from the senses)	7
Not sure	

Q4.1.

In your opinion, are there any other philosophical underpinnings that are core to the definition of physical literacy that are missing from this list above?

Please list and justify

Q5.

In your opinion, identify the domains (if any) that relate to your definition of physical literacy?

N.B You can select multiple domains

- ☒ Physical
- ☒ Affective (e.g. confidence, motivation)
- ☒ Cognitive (e.g. understanding and knowledge)
- ☒ Social
- ☐ Spiritual
- ☐ Cultural
- ☐ Other

Q5.1. If you selected 'other', please comment to justify your answer

This question was not displayed to the respondent.

Appendix 5.1 – Round 1

Dear Expert,

Thank you for agreeing to participate in this research study.
The aim of this study is to reach a consensus on the Definition, the Domains and the Elements of Physical Literacy.

Participant Involvement

You will be required to complete three rounds of discussions, over the course of six weeks. The themes to each round are as follows:

Round 1 Defining and Understanding Physical Literacy and the Relevant Underlying Domains
29th March 2017 - 12th April 2017

Round 2 Identifying the Elements that Underpin These Domains
19th April 2017 - 03rd May 2017

Round 3 Discuss How These Elements Might be Measured?
10th May 2017 - 24th May 2017

Research Team

Principal Investigator

Will Roberts MA, PGDip, PGCEtHE, BSc (Hons), SFHEA
Faculty of Health and Life Science, Oxford Brookes University
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Principal Researcher

Christopher Cutter, BSc (Hons)
Faculty of Health and Life Science, Oxford Brookes University
Email: 15109373@brookes.ac.uk

Participant Information

How have I been recruited to participate in this project?

20 experts, of which you are one, have been identified by the research team, via existing literature, pertaining to the field of physical literacy, physical education, psychology, physiology, sociology, human movement or assessment.

Do I have to take part?

No. Nobody will be forced to take part and there are no incentives to participate, nor costs/consequences for declining to participate. Likewise, you may withdraw from the research after it has started, with no risk or consequence. The same opportunities to decline or withdraw are available to everybody involved.

If you do participate, you do have the option to leave any questions blank that you feel uncomfortable answering. Please note that whilst you are under no obligation to answer any of the questions, the more information that you are able to provide will enhance the richness of data and strengthen the outcomes that may be drawn from the results. Participating experts who do not respond to each round by the given deadlines may be withdrawn from subsequent rounds. If this is the case, this will be documented in the results.

What are the possible disadvantages and risks of participation?

There are no anticipated risks or disadvantages associated with taking part in on-line surveys. Great care will be taken to ensure that any findings drawn from the data do not allow identification of individuals from outside sources and raw data will not be published in any resulting reports. Following the Delphi, there will be an opportunity for you to undersign the result of the study, this will ensure that the participants have been represented correctly.

What do I need to do if I am happy to take part?

Please indicate your consent below and then respond in full to the survey that follows. This allows you to indicate that you give consent to take part in the study, and that you understand the level of involvement.

What do I need to do if I am not happy to take part?

Click 'No, I do not feel able to participate', below. This will terminate this survey.

Will my participation in the study be kept confidential?

Yes. The only people who will have access to the responses you give will be the research team, named above. All data collected by this study will be secured and stored on a password locked computer system as in agreement with the university regulations. None

of the information that you provide will be reported in a manner that allows the identification of individuals in relation to specific data points. The research outcomes will be presented in a dissertation, which will be submitted in part fulfillment of the regulations for the MA(Res) Degree at Oxford Brookes University.

Ethics Committee Clearance

The project has been approved by The Health and Life Science Departmental Ethics Committee at Oxford Brookes University.

Questions and Concerns

If you have any queries regarding the questions in the survey, the research project in general or the storage of data, then please do not hesitate to contact the research team. Their contact details are at the top of this page. Alternatively, you can contact Anne Delextat, the Departmental Research Ethics Officer (adelextat@brookes.ac.uk).

Consent

Do you agree with the following statements?

1. I confirm that I have read and understood the information sheet for the above study
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. Furthermore, I understand that such refusal or withdrawal would hold no negative consequences for me.
3. I have been advised of the potential risks associated with this study and I have had an opportunity to ask the research team any questions that I may have about the study and my participation.
4. I understand that the data collected will be used for the purpose of a Postgraduate dissertation, poster and/or conference presentation, and I consent for it to be used in that manner. Any information that I provide will remain strictly confidential.

By clicking 'yes' below, I am indicating my consent to participate in the research as described in the information provided.

☒ Yes, I understand and agree to participate

☐ No, I do not feel able to participate

. Which best describes your field of work?

(The drop down list is presented in alphabetical order)

Physical Literacy ▼

. As you selected 'other', please specify

This question was not displayed to the respondent.

Round 1

Defining and Understanding Physical Literacy and the Relevant Underlying Domains
To be completed by 23:59 on the 12th April 2017

Q1. How do you currently define Physical Literacy?

Please feel free to use either your own words or text from an existing definition

I am most comfortable with the Canadian Consensus Statement on PL. It is the same as the IPLA definition

Q1.1.

In your opinion, what are the strengths or positive attributes of the definition that you have provided above?

Please list up to 3

Breadth of inclusion and holistic intent

Q1.2. In your opinion, what might be the weakness or problems with the definition that you have provided?

Please list up to 3

None

Q1.3. In your opinion, is the definition that you have provided process or outcome driven?

- ☒ Physical Literacy is process driven
☐ Physical Literacy is outcome driven
☐ Physical Literacy is both a process and an outcome
☐ Physical Literacy is neither a process or an outcome

Q1.3.1. Please provide up to 3 reasons to support your answer

It speaks to PL as a journey Refers to the lifespan Includes everyone

Q1.3.2. Please provide up to 3 reasons to support your answer

This question was not displayed to the respondent.

Q1.3.3. Please provide up to 3 reasons to support your answer

This question was not displayed to the respondent.

Q1.3.4. Please provide up to 3 reasons to support your answer

This question was not displayed to the respondent.

Q2. In your opinion, are there any assumptions that are made when defining Physical Literacy?

- ☒ Yes
☐ No

Q2.1. In your opinion, what are these assumptions?

That all humans are typically developing. It may not account for those with special needs explicitly.

Q2.2. Please comment, as to why you do not think there are any assumptions made when defining Physical Literacy?

This question was not displayed to the respondent.

Q3.

From your experience, please indicate which of the following are core to your definition of Physical Literacy.

You will notice some overlapping notions. In the first round, do not worry about this.

(The following are presented in alphabetical order)

	Core to the definition	Neither agree nor disagree that this is core to the definition	Not core to the definition
Ability to read the environment	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Able to demonstrate a variety of movements confidently, competently, creatively and strategically	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agility	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Balance	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Cognitive development	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Competence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Coordination	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Culture	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Decision making	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Developing physical skills	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Development of the whole person	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empathy	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Flexibility	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
For life/throughout life/lifelong participation/engagement in physical activity	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual endowment	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interaction with the environment	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Knowledge and understanding to value and take responsibility for engagement in physical activity	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Learning	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mastering fundamental movement skills (FMS)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Motivation	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Move with competence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Move with confidence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Occurring in adults	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Occurring in childhood and adolescence	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Participation in physical activity	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation in physical education	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Participation in sport	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Perceptions of own physical competence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical competence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical development	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Physical fitness	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Reaction time	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Religion/Faith	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Spatial awareness	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Self-confidence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-esteem	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Social development	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Speed	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Sporting success	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Strategy/tactics	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Support from significant others	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
To take part in lots of different physical activities	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To understand, communicate, apply and analyse different forms of movement	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
To take part in lots of different sports	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Understanding emotions/relating to others	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Unique journey	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value and take responsibility for physical activity	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Whole person/embodiment



Q3.1. In your opinion, are there any other notions that are core to the definition of Physical Literacy that are missing from this list above?

Please list and justify

Q4. In your opinion, which philosophical underpinnings (if any) are core to your definition of Physical Literacy?

Again, you will notice some overlapping notions. In this first round, do not worry about this.

(The following are presented in alphabetical order)

	Core to the underpinning of the definition	Neither agree nor disagree that this is core to the underpinning of the definition	Not core to the underpinning of the definition
Critical realism - (an interface between the natural and social worlds)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Dualism - (the division of something conceptually into two opposed aspects e.g body and mind as separate)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Embodiment - (mind and body are one)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empiricism - (all knowledge is based on experience derived from the senses)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Existentialism - (individual's unique perspective of the world, arises due to the experiences of interacting with the world around us)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Monism - (denies the existence of a distinction or duality in a particular sphere, such as that between body and mind)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Objectivity - (related to reality and truth. Generally means the state of being true even outside of a subject's individual biases, interpretations, feelings and imaginations)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Phenomenology - (the way in which an individual perceives the world from their unique point of view)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Positivism - (a philosophical system recognising only that which can be scientifically verified or which is capable of logical or mathematical proof).	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Post positivism (Whilst positivists believe that the researcher and the researched person are independent of each other, postpositivists accept that theories, background, knowledge and values of the researcher can influence what is observed)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Pragmatism - (a philosophical movement that includes those who claim that an ideology is true if it works satisfactorily, that the meaning or a proposition is to be found in the practical consequences of accepting it, and that unpractical ideas are rejected)



Subjectivity - (the quality of being based on or influenced by personal feelings or opinions)



Q4.1.

In your opinion, are there any other philosophical underpinnings that are core to the definition of Physical Literacy that are missing from this list above?

Please list and justify

Q5.

In your opinion, identify the domains (if any) that relate to your definition of Physical Literacy?

N.B You can select multiple domains

(The following are presented in alphabetical order)

☒ Affective (e.g. confidence, motivation)

☒ Cognitive (e.g. understanding and knowledge)

☒ Cultural

☒ Physical

☒ Social

☐ Spiritual

☐ Other

Q5.1. As you selected 'other', please comment to justify your answer

This question was not displayed to the respondent.

Appendix 5.2 – Round 2

Dear Expert,

Thank you for time in regards to completing Round 1, especially as the deadline fell around the Easter break.

In particular thank you for providing your insight into a) how you define Physical Literacy; b) the strengths and weaknesses of your definition; and c) the assumptions that are made when defining the concept.

I have attached a Summary Report of Round 1 for you to read, along with a PDF copy of your response to Round 1 as a guide for this round, as the next stage of this Delphi is to seek your input regarding the Domains (and Elements) that underpin the Physical Literacy concept.

Participant Involvement

Round 2 Identifying the Elements that Underpin the Domains of Physical Literacy
19th April 2017 - 03rd May 2017

Round 3 Discuss How These Domains/Elements Might be Measured?
10th May 2017 - 24th May 2017

Research Team

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Consent

Do you agree with the following statements?

1. I confirm that I have read and understood the information sheet (which I have received via email)
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. Furthermore, I understand that such refusal to withdraw would hold no negative consequences for me.
3. I have been advised of the potential risks associated with this study and I have had an opportunity to ask the research team any questions that I may have about the study and my participation.
4. I understand that the data collected will be used for the purpose of a Postgraduate dissertation, poster and/or conference presentation, and I consent for it to be used in that manner. Any information that I provide will remain strictly confidential.

By clicking 'yes' below, I am indicating my consent to participate in the research as described in the information provided.

☒ Yes, I understand and agree to participate

☐ No, I do not feel able to participate

Round 2

Identifying the Elements that Underpin the Domains of Physical Literacy
To be completed by 23:59 on the 03rd May 2017

Q1.

In order to reach an agreement, which of the following best defines Physical Literacy?

Please note that you can only select one

- ☐ Physical literacy is defined as "a disposition to capitalise on the human embodied capability, wherein the individual has the motivation, confidence, knowledge and understanding to value and take responsibility for engaging in physical activity for life"
- ☐ Physical literacy is defined as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life"
- ☒ Physical literacy is defined as "lifelong holistic learning acquired and applied in movement and physical activity contexts. It reflects on-going changes integrating physical, affective, cognitive and social capabilities. It is vital in helping us lead healthy and fulfilling lives through movement and physical activity. A physically literate person is able to draw on their integrated physical, affective, cognitive and social capabilities to support health, promoting and fulfilling movement and physical activity - relative to their situation and context - throughout their lifespan"
- ☐ None of the above best defines Physical Literacy

Q1.1.

Please indicate as to **why** none of the given definitions best defines Physical Literacy

In addition to your reasoning, please provide an alternative definition.

This question was not displayed to the respondent.

Q2.

The report from Round 1 indicated that 64% of responses identified their/the definition of Physical Literacy as **complex**.

66% of those that identified this, indicated that Physical Literacy requires further explanation.

Do you agree?

- ☒ Yes
- ☐ No

Q2.1A. Which of the following supports your answer?

Please note that you can select multiple answers

- ☒ Difficult to understand?
- ☒ Difficult to translate into a practical framework?
- ☐ Misunderstanding of the term Literacy?
- ☒ General over emphasis on FMS / physical competency?
- ☐ Other (please specify)

Q2.1B. Please provide 3 reasons to support your answer

This question was not displayed to the respondent.

Q2.1.1.

Please comment as to what this 'further explanation' might consist of?

Q3. The report from Round 1 indicates that 64% of responses selected four learning domains - affective, cognitive, physical and social - that underpin the concept of Physical Literacy.

- ☒ I agree with the use of the 4 learning domains, to underpin the definition of Physical Literacy
- ☐ I agree - but with some changes - to the use of learning domains, to underpin the definition of Physical Literacy (please specify as to what these domains are)
- ☐ I disagree and propose the use of a different learning approach (please specify alternative approach)

Q4. What elements underpin these learning domains?

Please list as many as you can, as the more detail that you provide here the more in-depth the report will be)

Affective

Confidence Intrinsic motivation Desire to participate Value of physical activity

Cognitive

Knowledge about why it's important to be physically active Understanding benefits of exercise

Physical

Health benefits Motor proficiency Skill related components of fitness Healthy weight

Social

Peer interaction Fun Happiness Cooperation Engagement

Q5. 71% of respondents from Round 1 EITHER referred Physical Literacy as an **outcome** OR referred to the concept has being both a **process and an outcome**

Refer to the Summary Report for more details

☐ I agree that PL has an outcome (please specify as to what this outcome is)

☒ I disagree that PL has an outcome (please justify your answer)

There is no end point in the PL journey. Constant state of flux. It's a lifelong commitment that ebbs and flows.

Q6. Should Physical Literacy be measured?

☒ Yes

☐ Maybe

☐ No

Q6.1. Please give 3 reasons as to why Physical Literacy **should** be measured

Evaluate relative changes in ones PL journey To evaluate programs that purport to be improving PL To understand the state of PL development at various ages

Q6.2. Please give 3 reasons as to why Physical Literacy should **maybe** be measured

This question was not displayed to the respondent.

Q6.3. Please give 3 reasons as to why Physical Literacy **should not** be measured

This question was not displayed to the respondent.

Appendix 5.2.1 – Tracking of Definitional Response Between Round 1 to Round 2

Physical literacy is defined as "a disposition to capitalise on the human embodied capability, wherein the individual has the motivation, confidence, knowledge and understanding to value and take responsibility for engaging in physical activity for life" (Whitehead, 2001)	Physical literacy is defined as "the motivation, confidence, knowledge and understanding to value and take responsibility for engagement in physical activities for life" (Whitehead, 2010; IPLA, 2016)	Physical literacy is defined as "lifelong holistic learning acquired and applied in movement and physical activity contexts. It reflects on-going changes integrating physical, affective, cognitive and social capabilities. It is vital in helping us lead healthy and fulfilling lives through movement and physical activity. A physically literate person is able to draw on their integrated physical, affective, cognitive and social capabilities to support health, promoting and fulfilling movement and physical activity - relative to their situation and context - throughout their lifespan" (Keegan et al., 2016; ASC, 2016)
Panellist 9*	Panellist 3*	Panellist 1*
Panellist 10*	Panellist 4*	Panellist 2
Panellist 16*	Panellist 11*	Panellist 5*
	Panellist 12*	Panellist 6*
	Panellist 13*	Panellist 7*
	Panellist 15*	Panellist 8*

Panellist 14 completed Round 1, but then declined Round 2, therefore their response has been omitted from this table. Coincidentally, their response to question 1, Round 1 did not emulate either of the three definitions presented in Round 2.

Key

*Indicates that these panellists used the words motivation, confidence, physical competence, knowledge and understanding to question 1 in Round 1, whilst **yellow highlight** indicates that these panellists did not respond to Round 3. **Bold font** indicates that these panellists agreed with IPLA's definition in Round 3. Please note that Panellist 6 agrees with IPLA's definition for the most part, however, its current definition omits the social aspect. Whilst Panellist 8 disagrees with IPLA, as its definition conflates different aspects (e.g. processes, performances and outcomes) and fails to indicate the importance of the holistic, integrated nature of physical literacy. As such, it contributes to and exacerbates current problems spanning from failure to take it up (e.g. we already do that, or what's new) to also include inappropriate uptake.

Appendix 5.2.2 – List of Elements Collated from Round 2

Affective	Cognitive	Physical	Social
Self-determined (intrinsic) motivation, confidence (self-efficacy), perceived competence.	Knowledge and understanding of: benefits of being active; how to improve physical competence, tactics, how to find opportunities to be active.	Motor competence, health and skill fitness.	Supporting teammates/friends. Awareness of social benefits of participation.
Motivation, confidence, self-efficacy, social support.	Knowledge, understanding.	All aspects of performing physical activity – skill, balance, endurance, strength, flexibility etc.	Quality of life.
Motivation, confidence, self-esteem, self-efficacy, self-worth, value physical activity, take responsibility for participation in physical activity.	Knowledge and understanding of: physical activities; healthy and active lifestyles, value physical activity, take responsibility for participating in physical activity.	Movement capacities (balance, coordination – hand/eye, foot/eye – dexterity). Motor skill competence (fine and gross motor skills). Developing movement patterns (applying fundamental movement patterns into a real-life setting). Fundamental movement skills (locomotor, stability and manipulative skills). Purposeful and meaningful physical pursuits.	Interaction with peers in a physical context. Read/interact with the environment. Developing transferable skills through experiences (communication, team building, problem solving). Willingness to try new activities alone or with peers. Social and moral support from significant others (teachers, coaches, parents/guardians, friends).
The ability to remain proactive in terms of one's motivation, to remain physically active within a balanced lifestyle, the ability to demonstrate confidence to be able to move with efficacy in any situation.	The ability to know, understand and accept that physical activity is crucial for human existence. Be able to share the concept of PL with others and inspire them to remain active for life. To efficiently use the environment with purpose to aid movement. To dedicate to a lifestyle which will remain non-sedentary.	The ability to move with poise, certainty and accuracy in a range of environments and settings.	The ability to either work independently or with others. To able to help and assist with other's movement capability, either through direct manipulation or non-physical support.
Motivation, resilience, autonomy, self-regulation, emotional control.	Intentionally, understanding, problem solving, planning, goal orientation.	Multi skilled, adaptability, flexibility.	Cooperation, competitiveness with oneself/others. Affiliation, relatedness.
Focus, self-regulation, distraction control, positive self-talk, perseverance, grit, self-assessment, understanding of quality practice, goal setting, realistic performance evaluation,	Knowledge of: movement, sports and activities, rules. Understanding of sporting and other activity cultures. Decision making, tactics. Health benefits of movement. Training methods. Healthy lifestyle: diet, sleep, sedentary	Interceptive timing. Object manipulation. Locomotion and agility. Spatial awareness. Rhythm and sequencing. Squat, lunge, pull, push, twist, brace, hinge, CV endurance, muscular endurance,	How to pose questions, listening to understand, positive feedback, motivation, encouragement, group work, team work, personal and social responsibility, communicate effectively, use correct technical

creating and using support, resilience.	behaviours etc. Find personal meaning in movement.	muscular strength, flexibility, sports skills.	language, guide and support peers.
Confidence, intrinsic motivation, desire to participate, value of physical activity.	Knowledge about why it's important to be physically active. Understanding benefits of exercise.	Health benefits. Motor proficiency. Skill related components of fitness. Healthy weight.	Peer interaction, fun, happiness, cooperation, engagement.
Confidence, motivation, self-esteem (self-efficacy), perceived competence, enjoyment, sensation, perception, expression, emotions (controlling emotions).	Knowledge and understanding of healthy and active lifestyles – hence can value physical activity. Knowledge and understanding of activities could be broken down into tactics, strategies, rules, reasoning, decision making etc.	Physical competence (could be broken down to locomotor, body management, manipulative actions) includes (agility, flexibility, strength, power, speed, cardiovascular fitness, balance, reaction time, muscular endurance.	Interaction with others (parents, friends, teachers, coaches etc.). Connection to the environment. Society. Risk. Safety.
The ability to understand own emotions, ability to empathise with others, ability to understand impact of own actions and behaviours on self and others.	Self-analysis. Tactical understanding. Strategic thinking. Knowledge of skills, techniques, rules and responsibilities. Decision making. Problem solving.	Strength, speed, power, agility, flexibility, endurance, stature, coordination, reaction time, appearance, ability/disability/ impairment.	Teamwork. Cooperation. Communication (verbal and non-verbal). Empathy. Leadership.
Motivation, confidence, self-esteem.	Knowledge and understanding (self-awareness).	Physical competence.	Individual or group, which relates to the environment/context of activity.

Appendix 5.3 – Round 3

Dear Expert,

Thank you for your patience with the slight delay to the distribution of Round 3. As you are aware, the responses to Round 1 and 2 highlighted a number of interesting data points, therefore I requested further meetings with my Principal Researcher to ensure that you, as an expert group, are represented appropriately and correctly.

I have attached the Summary Reports and a PDF copy of your responses to the previous two rounds. Please use these documents to complete this round, which should only take 10-15 minutes of your time.

We are close to reaching a consensus on the Definition, Domains and Elements of Physical Literacy.

Consent.

Consent

Do you agree with the following statements?

1. I confirm that I have read and understood the information sheet (which I received via email)
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. Furthermore, I understand that such withdrawal would hold no negative consequences for me.
3. I have been advised of the potential risks associated with this study and I have had an opportunity to ask the research team any questions that I may have about the study and my participation.
4. I understand that the data collected will be used for the purpose of a Postgraduate dissertation, poster and/or conference presentation, and I consent for it to be used in that manner. Any information that I provide will remain strictly confidential.

By clicking 'yes' below, I am indicating my consent to participate in the research as described in the information provided.

☒ Yes, I understand and agree to participate

☐ No, I do not feel able to participate

Round 3.

Round 3

Discuss How These Domains / Elements might be measured
To be completed by 23:59 on 14th June 2017

Q1.

Definition

81.25% of responses to Question 1 in Round 1, used the words 'motivation', 'confidence', 'physical competence', 'knowledge and understanding', 'responsibility', 'physical activity' and 'for life' to define Physical Literacy.

These words closely align to The International Physical Literacy Association's definition.

The IPLA defines Physical Literacy as 'the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life'.

However when Question 1, in Round 2, asked which given definition best defines Physical Literacy? Only 40% of responses selected IPLA's definition.

In light of the contradictory selections - and given that 81.25% used the words that align with the IPLA's definition - can you agree on IPLA's definition to define Physical Literacy?

☒ Yes, I agree on IPLA's definition

☐ No, I disagree on IPLA's definition of Physical Literacy (please provide reasoning as to why)

Q2.

Process or Outcome

After interpreting the results of Question 1.3, in Round 1, 81.25% of responses identified that Physical Literacy is a process and that it has an outcome.

Process	Outcome
A dispositional (non-linear) journey	More confident, more motivated individuals who are engaged in physical activities for longer

100% of responses to Question 1, in Round 2, chose definitions that are a process and of which have an outcome.

Are you in agreement that Physical Literacy is a process, and that it has an outcome?

- ☒ Yes, I agree that Physical Literacy is a process, and that it has an outcome (as described in the table)
- ☐ I agree that Physical Literacy is a process, and that it has an outcome, **BUT** I disagree with the description of these in the table (please provide an alternative description)
- ☐ No, I disagree. Physical Literacy is **NOT** a process and it **DOES NOT** have an outcome (please provide reasoning as to why)

Q3.

Domains

92.86% of responses to Question 2, in Round 2, identified that one reason as to why Physical Literacy is complex is that it is difficult to translate into a practical framework.

100% of respondents agreed on the use of learning Domains (and Elements) as a means to provide a practical framework. 86.67% of responses agreed on 4 learning Domains - Affective, Cognitive, Physical and Social.

13.33% of responses disagreed with the Domain Social, claiming that this does not align with Whitehead's work. However, Edwards et al's (2016) systematic review does include this Domain.

Do you in agreement with these 4 learning Domains?

- ☒ Yes, I agree with these 4 Domains
- ☐ No, I disagree on these 4 Domains (please provide reasoning as to why)

Q4. Elements

Question 4, in Round 2, asked you to list elements that underpin the 4 learning domains.

Do you agree with the underpinning Elements in the **Affective** Domain?

If you want to comment specifically on one element then please use the text box under that element.

	Agree	Disagree	Not applicable
Motivation (intrinsic)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confidence	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-esteem	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-efficacy	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-worth	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-perception	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resilience	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Emotional control	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Focus (distraction control / self-talk)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Self-regulation	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Grit	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Perseverance <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Self assessment (performance evaluation) <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Goal setting <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Desire <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoyment <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Willingness to try <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perception <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proprioception <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fatigue <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Exertion <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Energisation <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Q4.a. Please list any **Affective** Elements, that you think are missing from the list above.

Q4.2. Do you agree with the underpinning Elements in the **Cognitive** Domain?

	Agree	Disagree	Not applicable
A knowledge and an understanding of the benefits of being active <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
A knowledge and an understanding of how to find opportunities to be active <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge of how to improve <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge and an understanding of how to take responsibility for participating in physical activities <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understand an accept that physical activity is crucial for human existence <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
A knowledge and an understanding of sharing <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Knowledge and an understanding of how to adopt a non-sedentary lifestyle <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem solving <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Planning and goal setting <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

A knowledge and an understanding of how your body moves <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding and an awareness of self and others <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Understanding of strategy and tactics <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Awareness of your body in time and space <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge and understanding of the benefits of sleep <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge and understanding of a healthy diet <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Q4.2.a. Please list any **Cognitive** Elements, that you think are missing from the list above.

Q4.3. Do you agree with the underpinning Elements in the **Physical** Domain?

	Agree	Disagree	Not applicable
Motor competence (gross and fine) <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balance <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coordination (hand/eye; foot/eye; dexterity) <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agility <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speed <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Endurance <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Movement patterns - e.g crawl, walk, run, hop, skip, jump (forwards, backwards and sideways) <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensory <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Move with poise, fluidity, certainty and accuracy in a range of environments <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Direct and indirect) object manipulation <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interceptive timing <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Spacial awareness <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Rhythm, sequencing and timing <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CV endurance <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Strength and power <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Ability, disability, impairment <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reaction time <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Stature and posture <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Ability to interact with the environment <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4.3.a. Please list any **Physical** Elements, that you think are missing from the list above.

Q4.4. Do you agree with the underpinning Elements in the **Social** Domain?

	Agree	Disagree	Not applicable
Supporting self and others <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of life <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interaction with others / environment <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support self, others <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperation with others <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assist/help others <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Competitiveness with self, others <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Affiliation with others <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Relatedness <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicate effectively - verbal, non-verbal, listen <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouragement <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Fun <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engagement <input type="text"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of different beliefs, cultures <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Safety <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Q4.4.a. Please list any **Social** Elements, that you think are missing from the list above.

Q8. 93% of responses to Question 6, in Round 2, indicated that Physical Literacy should be measured, as this would allow:

- Progress/PL journey to be tracked/charted
- Evaluate the teaching/coaching provision associated with developing Physical Literacy
- Influence policy makers, stakeholders

How would you measure/evaluate/assess/observe/chart/track a concept that is non-linear, complex and deeply integrated, which is beyond most (common) techniques?

Please note, you can select more than one answer

☐ Practitioner (subjective) observations

☒ Battery test of each Domain (please support your answer by providing a battery test for each domain)

☐ SOLO Taxonomy (Structure of the Observed Learning Outcome)

☒ Individual 'I can statements' (which are to be completed by the individual)

☐ SOFIT (System for Observing Fitness Instruction Time) / Or similar tool (please specify)

☐ Other (please specify)

Appendix 6 – Consensus Statement

Overarching Philosophy
<i>Embodiment, Existentialism and Phenomenology.</i>

Definition of Physical Literacy
<i>Physical literacy is defined as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life.</i>

Process	Outcome
<i>Creating an environment and opportunity whereby motivation, confidence, physical competence, knowledge and understanding in physical activity can be developed and nurtured.</i>	<i>More confident, motivated, skilled and knowledgeable individuals who value physical activity and choose to participate for life.</i>

Domains
<i>Affective, Cognitive, Physical and Social (in alphabetical order)</i>

Underpinning Elements (in alphabetical order)	
<i>Affective</i>	<i>Confidence, Motivation, Self-regulation.</i>
<i>Cognitive</i>	<i>Awareness, Communication, Content Knowledge, Creativity, Decision Making, Reaction-time, Safety & Risk, Self-assessment, Understanding & Reasoning.</i>
<i>Physical</i>	<i>Agility, Balance, Cardiovascular Endurance, Coordination, Flexibility, Movement, Movement Using Equipment, Muscular Endurance, Posture, Power, Speed, Strength.</i>
<i>Social</i>	<i>Collaboration, Connectedness, Ethics, Society & Culture.</i>